PROCEEDINGS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS

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AMERICAN SOCIETY OF CIVIL ENGINEERS

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PROCEEDINGS

SOCIETY AFFAIRS

CONTENTS

MINUTES OF MEETINGS OF THE SOCIETY

November 3d, 1920.—The meeting was called to order at 8 P. M.; Arthur S. Tuttle, Treasurer, Am. Soc. C. E., in the chair; Herbert S. Crocker, Acting Secretary; and present, also, 100 members and guests.

The minutes of the meetings of September 15th, and of October 6th, 1920, were approved as printed in *Proceedings* for October, 1920.

A paper by J. A. L. Waddell, M. Am. Soc. C. E., entitled "Creeping of Railroad Rails" was presented by the author, who gave the significant results of a questionnaire on the various phenomena of creeping, and methods of overcoming it. The subject was discussed orally by Messrs. T. Kennard Thomson, George D. Snyder, D. L. Turner, Daniel Bontecou, B. H. Bryant, Herbert C. Keith, F. W. Skinner, Louis C. Marburg, A. W. Buel, John Lundie, and Billings Wilson. Written discussions on the paper were received from Messrs. Orlando Metcalf, F. A. Preston, Wellington B. Lee, and F. S. Stevens.

The Acting Secretary announced the election of the following candidates on October 11th, 1920:

As Members

Hal Nelson Aikman, Jackson, Mich.
Howard Leffingwell Baldwin, Salt Lake City, Utah
George Scott Baton, Pittsburgh, Pa.

Albert Deering Case, Woodbury, N. J.
James Edward Cassidy, Washington, D. C.
William Bowdoin Causey, Vienna, Austria
Leo Otis Colbert, Washington, D. C.
Attilio D'Antona, New York City
Everett Addison Hadley, St. Louis, Mo.
Eugene Erwin Halmos, New York City
William Jethro Howland, Columbus, N. Mex.
Jacobus Kappeyne, New York City
Francis James Keis, Atlanta, Ga.
Henry Robertson Lordly, Montreal, Que., Canada
Ole Jacob Marsten, Harrisburg, Pa.
Elmer Kaufman Miller, Cleveland, Ohio
Robert Heffron Murray, City Point, Va.
Robert William Newton-Howes, Kuala Krau, India
Gilbert Thomas Rude, Washington, D. C.
John Rodolph Slattery, Portland, Ore.
Ross Kerr Tiffany, Spokane, Wash.

As Associate Members

Henry Abram Adams, Jr., Calcutta, India
Hugh Sidney Allen, Bakersfield, Cal.
Wesley Max Arnold, Cleveland, Ohio
John Francis Bathurst, Indianapolis, Ind.
Harry Mahlon Beaumont, Philadelphia, Pa.
Boyd Anderson Bennett, New York City
James Baysden Bennett, Russellville, Ark.
Milford Earle Binckley, Sapulpa, Okla.
Warren H. Booker, Charlotte, N. C.
Walter Alexander Bouve, Bay Point, Cal.
Charles Valentine Brewster, Syracuse, N. Y.
Ambrose Beauchamp Brown, Ogden, Utah
Ulysses Grant Brown, Oakland, Cal.
Wilson Robert Buie, Jr., Camden, N. J.
Harry Cady Byrnes, Lamar, Colo.
Eugene Olyn Campbell, St. Louis, Mo.
William Hampden Carutheis, St. Louis, Mo.
Johnson Chapman, Charleston, Mo.
Paul Noyce Coates, Worthington, Minn.
Carl Conrad Cooman, West Webster, N. Y.
Thomas Talleyrand Cresswell, East St. Louis, Ill.
Roy Warrington Cropper, Kansas City, Mo.
Earl Devendorf, Schenectady, N. Y.
Willis Arthur Dittman, Yonkers, N. Y.
Clarence Louis Eckel, Philadelphia, Pa.
George Frederick Eckhard, Burlington, Vt.
Barton Harvey Eveleth, Stockton, Cal.

George Bastian Farlow, Cincinnati, Ohio
Arthur Daniel Fields, New York City
George Gerald FitzGerald, Camarillo, Cal.
George Washington Fry, Abilene, Tex.
Wilbur Lee Fulton, Omaha, Nebr.
Albert Fredrick Garlinghouse, Aspinwall, Pa.
Walter Wesley Gaskins, Marysville, Mich.
Frank Palmer Graham, Grove City, Pa.
Colin Sutherland Grasett, Toronto, Ont., Canada
Richard Oscar Green, Hastings, Nebr.
John Frank Grimes, Frankfort, Ky.
John Murdoch Harbert, Indianola, Miss.
Henry Garner Harper, Bloomsburg, Pa.
Arthur Stafford Hathaway, Cincinnati, Ohio
John Griffiss Hazlehurst, Washington, D. C.
Hans Richard Frantz Helland, Waxahachie, Tex.
James Hansen Hjul, San Francisco, Cal.
Albert Wallace Hogeland, Detroit, Mich.
Augustus Hunt, Ardmore, Okla.
Haydn Records Hunter, Garden City, Kans.
Edward Hyatt, Jr., San Francisco, Cal.
Philip Louis Inch, Helena, Mont.
Jacob Oscar Jones, Lawrence, Kans.
Francis Wallace Lee, Columbia, S. C.
Louva Gerhard Lenert, La Grange, Tex.
William Whitaker McClendon, Mineral Wells, Tex.
Robert Aloysious McMenimen, Chester, Pa.
Myron Gorton Mansfield, Pittsburgh, Pa.
Leon Craig Marshall, Central Aguirre, Porto Rico
Thomas Belsham Merrick, Philadelphia, Pa.
Robert Lee Morrison, Bristol, Va.-Tenn.
William Wallace Moyer, Bismarck, N. Dak.
Clarence Eugene Noerenberg, Los Angeles, Cal.
Richard Hubert Pennartz, Topeka, Kans.
Elwynne Blair Proctor, New York City
Eugene Southard Risler, New Orleans, La.
Merle William Rosecrans, Salem, Ore.
Leon Herbert Sault, St. Paul, Minn.
Reginald Crowley Scott, Philadelphia, Pa.
Ernest Keven Sheble, San Diego, Cal.
Arthur Richards Smith, Greenwood, Ind.
Henry Grady Smith, Lagrange, Ga.
John Charles Sophian, Syracuse, N. Y.
John Albert Steel, Knoxville, Tenn.
Frederick George Switzer, Ithaca, N. Y.
Melbourne Stanton Taylor, Flint, Mich.
Frank Cessford Thorpe, Tulsa, Okla.

Frank Bernard Tucker, La Romana, Dominican Republic
Harry Ogle Tunis, Baltimore, Md.
Elmer Chester Louis Wagner, Kansas City, Mo.
Roy Elisha Warden, Little Rock, Ark.
Thomas Randall Carson Wilson, Madison, Wis.
Clyde Matheson Wood, Atlanta, Ga.

As Associates

Charles Pease Matheson, Washington, Pa.
Robert Kent Williams, Clarksburg, W. Va.

As Juniors

Edward Harold Coe, Babbitt, Minn.
Jerome Kaseberg Doolan, San Francisco, Cal.
Thomas Austin Forbes, Saltsburg, Pa.
Rogers Bruce Johnson, Cambridge, Mass.
Howard Franklin Koons, Perth Amboy, N. J.
David Doak Rainey, Tyler, Tex.
Albert Victor Sielke, New York City
Hal B. Tyler, Siquirres, Costa Rica

The Acting Secretary announced the transfer of the following candidates on October 11th, 1920:

From Associate Member to Member

Elmer Ellsworth Adams, Seattle, Wash.
Edwin Walker Buxton, Shreveport, La.
Charles John Crawford, Tampico, Tamps., Mexico
Willis Johnson Dean, Akron, Ohio
James Retzer Comly, San Diego, Cal.
Charles Eldridge Davis, Spokane, Wash.
Curt Henry Eiffert, Hamilton, Ohio
Richard Fahnestock Ensey, Jacksonville, Fla.
Frederick William Fisher, Rochester, N. Y.
Edward Thomas Flaherty, Los Angeles, Cal.
Benjamin Jay Garnett, Spokane, Wash.
Clement John Howard, Corpus Christi, Tex.
George Alfred Hughes, Brooklyn, N. Y.
Roy Husselman, Lakewood, Ohio
Jesse Aaron Jackson, Seattle, Wash.
Louis De Cou Kelsey, Raymond, Wash.
Mark Champion Krause, Williamsport, Pa.
Engbert A. Lee, Pueblo, Colo.
Edward Searles Lindley, Panjab, India
Edward Thomas Every Miller, Buenos Aires, Argentine Republic
Hans Mumm, Jr., Portland, Ore.
Kenneth Howard Osborn, Cleveland, Ohio
Albert Ayer Peters, San Francisco, Cal.
Carl Roy Rankin, San Francisco, Cal.

James Wynbourne Routh, Rochester, N. Y.
Charles Schultz, McKinney, Tex.
George Milson Shepard, St. Paul, Minn.
Chester Kitch Smith, San Francisco, Cal.
Victor Roy Walling, Chicago, Ill.
William Earl Weller, Binghamton, N. Y.
Walter Hall Wheeler, Minneapolis, Minn.
Chester Greenhalgh Wigley, New York City
Samuel Lamson Wonson, St. Louis, Mo.

From Junior to Associate Member

Dario Bressane, Campanha, Minas Geraes, Brazil
Clarence Cowgill Brown, Maryville, Tenn.
George Miles Collins, Honolulu, Hawaii
Frederick Conrad Gamsu, Boston, Mass.
Hector Clinton Griswold, Summit, N. J.
Henry Gardner Lehrbach, Charleston, S. C.
Ferdinand Leiser, Richmond Hill, N. Y.
Robert Bruce Murdock, Tuckahoe, N. Y.
Bartram Ashmead Owen, Philadelphia, Pa.
Charles William Pierce, Ogden, Utah
Edwin Newburger Seymour, Clarksdale, Miss.
Clifford Hoey Stem, New Orleans, La.
George Robert Strandberg, Boston, Mass.
Harrison Aubrey Underwood, Raleigh, N. C.
Henry Willcox, New York City

The Acting Secretary announced the following deaths:

Maximilian Ferdinand Bonzano, of Philadelphia, Pa., elected Member, January 6th, 1886; died October 30th, 1920.

William Ashburner Cattell, of Alhambra, Cal., elected Associate Member, May 6th, 1891; Member, October 7th, 1896; died October 17th, 1920.

George Elvin Datesman, of Philadelphia, Pa., elected Member, February 4th, 1903; died October 18th, 1920.

Henry Addison Hickok, of Newark, N. J., elected Member, October 7th, 1896; died July, 1920.

Robert Parsons Howell, of Blairstown, N. J., elected Associate Member, October 4th, 1905; Member, March 4th, 1913; died September 29th, 1920.

Richard Lamb, of New York City, elected Associate Member, May 6th, 1891; Member, June 6th, 1900; died October 18th, 1920.

Charles Austin Wentworth, of Wayne, Pa., elected Associate Member, October 7th, 1903; Member, January 2d, 1912; died February 21st, 1920.

Thomas Pengelly Ellis, of San Francisco, Cal., elected Associate Member, May 13th, 1918; died September 27th, 1920.

James Hilton Sherman, of Kansas City, Mo., elected Associate Member, May 15th, 1917; died October 2d, 1920.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

October 11th, 1920.—The Board met at 8 P. M. at the Headquarters of the Society; President Davis in the chair; H. S. Crocker, Acting Secretary; and present, also, Messrs. Clark, Curtis, Elwell, Greene, Ketchum, Langthorn, Tuttle, and Wagner.

Ballots for membership were canvassed, resulting in the election of 21 Members, 82 Associate Members, 2 Associates, and 8 Juniors, and the transfer of 15 Juniors to the grade of Associate Member.

Thirty-three Associate Members were transferred to the grade of Member.

Certain routine business was transacted.

A report from the Membership Committee was received and acted on.

Adjourned.

ACTION REGARDING FEDERATED AMERICAN ENGINEERING SOCIETIES

Society Votes Against Joining Federation

The report of the Tellers appointed to canvass the replies to the Questionnaire as to whether the Society should join the Federated American Engineering Societies as a Charter Member, which follows, shows that the adverse plurality was 948, and that all the Geographical Districts except Nos. 4, 6, 7, and 11 voted against joining the Federation.

The Board of Direction at its meeting held November 9th and 10th, 1920, received this report, and action was taken discharging the Joint Conference Committee as of date November 20th, 1920; the resolution in full by which this action was taken also follows. At this meeting the Acting Secretary was instructed to reply to a letter from the Joint Conference Committee regarding the acceptance of the invitation to join the Federation, and state that in accordance with the replies to the Questionnaire, the Society declines to become a Charter Member of the Federated American Engineering Societies.

REPORT OF TELLERS.

"NEW YORK, NOVEMBER 8TH, 1920.

"TO THE BOARD OF DIRECTION
"AMERICAN SOCIETY CIVIL ENGINEERS,

"GENTLEMEN:

"Your Committee delegated to canvass the replies to the Questionnaire:

"'Shall the American Society of Civil Engineers become a Charter Member of the Federated American Engineering Societies?'

presents its report as follows:

"Total number of replies received		5 989
"Deduct:		
"From members in arrears of dues	271	
"With lettered instead of written signature	30	
"From persons not members	6	
"From Juniors and Associates	8	
"Unsigned	56	
"Blanks	10	381
		5 608

RESULTS OF QUESTIONNAIRE, BY GEOGRAPHICAL DISTRICTS.

District.	1 Foreign.	1 Resident.	2	3	4	5	6	7	8	9	10	11	12	13	Total.
"Yes"	24	272	153	101	311	192	239	223	144	115	122	192	111	131	2 330
"No"	31	792	210	198	192	224	237	148	356	221	172	149	122	146	3 278
															5 608

"A copy of the form of reply is hereto attached.

"Respectfully submitted,

(Signed) "ALFRED D. FLINN, *Chairman*,
LESTER W. TUCKER, F. N. HATCH,
HARRY D. WINSOR, R. C. SCHWIND,
CLARENCE M. ERNST, WILLIAM M. LAMSON,
ORVILLE BENSON, J. BYERS HOLBROOK,
J. SPRINGER SWINDELLS, JOSEPH A. A. CONNELLY."

The geographical districts of the Society are shown on the map in the 1920 Year Book, facing page 30, and are as follows:

District No. 1.—Within 50-mile radius of New York City, and all outside of North America.
District No. 2.—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Brunswick, Nova Scotia.
District No. 3.—New York outside of District No. 1, and Quebec.
District No. 4.—Eastern Pennsylvania, Maryland, New Jersey outside of District No. 1, Delaware.
District No. 5.—District of Columbia, Virginia, North and South Carolina, Georgia, Florida.
District No. 6.—Western Pennsylvania, West Virginia, Ohio.
District No. 7.—Michigan, Wisconsin, Iowa, Minnesota, Manitoba, and Ontario.
District No. 8.—Illinois, Indiana, Kentucky, Tennessee.
District No. 9.—Alabama, Mississippi, Louisiana, Arkansas, Missouri.
District No. 10.—Oklahoma, Kansas, Colorado, Utah, Nebraska, Wyoming, North and South Dakota, Montana, Saskatchewan, Alberta.
District No. 11.—Texas, Mexico, New Mexico, Arizona, Southern California.
District No. 12.—Idaho, Washington, Oregon, Alaska, Yukon Territory, British Columbia.
District No. 13.—Northern California, Nevada.

Resulting Action by Board of Direction

The following resolution discharging the Conference Committee of the Society was passed at the November 9th Meeting of the Board of Direction:

"*Resolved:* As, in view of the result of the questionnaire ballot of November 8th, it is not possible for the American Society of Civil Engineers to join the Federated American Engineering Societies as a Charter Member, the Conference Committee appointed by this Board is hereby discharged as of date November 20th, 1920, with the thanks and appreciation of the Board for the zealous manner in which it has discharged its duties, and be it further

"Resolved: That inasmuch as no final report of the Conference Committee has been received by the Board, it is requested to make such final report not later than November 20th, 1920, to the Board; and

"Be it Further Resolved: That the Conference Committee of this Society is instructed to limit its activities from this date until the date of its discharge to the preparation and submission of its final report, and to incur no additional expense."

Two Committees Appointed on External Relations of the Society

At the meeting of the Board of Direction held November 9th and 10th, 1920, the following resolutions providing for two committees to consider the external relations of the Society were adopted:

"Whereas: The American Society of Civil Engineers has voted not to become a Charter Member of the Federated American Engineering Societies, and

"Whereas: In the Questionnaire of April 14th, 1920, the Society approved the idea to actively co-operate with other engineering and allied technical associations in promoting the welfare of the Engineering Profession,

"Resolved: That the following Committee of Corporate Members of the Society not members of the Board of Direction be appointed to consider and make recommendations to the Board on or before January 1st, 1921, of its suggestions for determining and governing the external relations of this Society with other engineering societies:

	District No.		*District No.*
"W. T. Chevalier	1	J. H. Dunlap	7
George A. Johnson	1	W. D. Gerber	8
Ralph W. Horne	2	W. J. Burton	9
Charles A. Poole	3	John S. Means	10
Edgar M. Hoopes, Jr.	4	S. B. Morris	11
R. C. Marshall, Jr., *Chairman.*	5	Fred M. Randlett	12
Kenneth C. Grant	6	C. H. Snyder	13."

Subsequently, the following motion was carried:

"Moved: That a Committee be appointed consisting of all the living Past-Presidents of the Society, which Committee will be requested to review and transmit to the Board the Report of the Committee of Corporate Members, heretofore appointed at this meeting to consider and recommend suggestions for determining and governing the external relations of this Society with other Engineering Societies; that the Committee of Past-Presidents be requested to take cognizance of the history of the Society for the last three years, and to give the Board the benefit of its advice at the next regular meeting of the Board to be held January 17th, 1921; and further that seven members shall constitute a quorum of the said Committee for the transaction of business, due notice having been given to all members of its proposed meetings, and that the Committee shall select its own Chairman."

Further action was taken in instructing the Acting Secretary to arrange the date for the meeting of the Committee of Past-Presidents as soon as practicable after January 1st, 1921.

Action was also taken in allowing mileage at the approved committee rate of 6 cents per mile to cover all expenses of members attending the meetings of these Committees.

The living Past-Presidents of the Society who are therefore members of the second committee thus appointed, are as follows:

Onward Bates,
John A. Bensel,
George H. Benzenberg,
F. S. Curtis,
M. T. Endicott,
Desmond FitzGerald,
Clemens Herschel,
Charles Macdonald,

Charles D. Marx,
Hunter McDonald,
Robert Moore,
J. A. Ockerson,
George H. Pegram,
George F. Swain,
A. M. Talbot,
John F. Wallace.

COMMITTEE ON CONSTITUTIONAL AMENDMENTS WORKING ON THOROUGH REVISION

The Committee on Referred Amendments appointed by the Board of Direction at the time of the Annual Convention in Portland, Ore., August 12th, 1920, submitted a progress report to the Board at its meeting held November 9th and 10th, 1920, stating that it was the unanimous conviction of the six members present at the second meeting of the Committee that an all-inclusive study and revision of the Constitution was required. The report of the Committee is as follows:

"BOSTON, MASS., NOVEMBER 2D, 1920.

"TO THE BOARD OF DIRECTION,
AMERICAN SOCIETY OF CIVIL ENGINEERS.

"GENTLEMEN: Your Committee on Referred Amendments begs to submit the following progress report:

"A preliminary meeting of the Committee was held in Chicago September 22d and 23d, 1920, with six members present, and a study was made of the amendments which had been sent to ballot and those which had been referred to the Committee.

"A second meeting was held, also in Chicago, on October 12th and 13th, 1920, at which six members were present. All members appointed by the Board have consented to serve excepting Mr. Franklin I. Fuller of Portland, Ore., who after advising the Committee that he could possibly attend meetings held in October, later found that his engagements would not permit and telegraphed his resignation. The Committee thereupon requested Mr. S. H. Hedges of Seattle, Washington, to serve, but he also declined and to date the vacancy has not been filled.

"At the second meeting of the Committee, it was furnished with a record of the ballot which had been canvassed on October 6th. Upon consideration of this report on the canvass of the ballot, the Committee found that it was unable to limit itself to the referred amendments, as so many other details of the Constitution are interwoven therewith.

"The Committee was unanimous in the conviction that the best interests of the Society required an all-inclusive study and revision of the Constitution. The letter of appointment to the members of the Committee contained the statement 'that the committee be empowered to suggest such other amendments as it may deem advisable, and also to employ counsel if deemed necessary'. Mr. Baker, of Messrs. Parker and Aaron, counsel for the Society, who was present by request, was consulted as to whether the Committee was authorized to undertake the work on the broadest possible lines. Upon being advised that it was so authorized, the Committee decided to proceed accordingly.

"Under these circumstances it is not possible to submit a final report by November 6th, but progress made at the meeting of October 12th-13th and subsequently by Counsel and by members of the Committee seems to justify the belief that the final report with a proposed amended Constitution and proposed By-Laws will be in readiness to submit to the meeting of the Board of Direction which takes place just prior to the Annual Meeting.

"Respectfully submitted,

(Signed) "PAUL H. NORCROSS, *Secretary*
LOUIS R. ASH,
ARCHIBALD S. BALDWIN,
"P. JUNKERSFELD, *Chairman*,
JOHN F. COLEMAN,
LEROY L. HIDINGER,
EDWARD J. SCHNEIDER."

ITEMS OF INTEREST

The Committee on Publications will be glad to receive communications of general interest to the Society, and will consider them for publication in *Proceedings* in "Items of Interest". This is intended to cover letters or suggestions from our membership concerning matters which are not of a technical character. Such communications, however, must not be controversial or commercial.

NATIONAL SERVICE DEPARTMENT OF ENGINEERING COUNCIL

In response to frequent expression of need, Engineering Council announces the establishment of a National Legislative and Departmental Information Service for engineers in all branches of the Profession. Information relative to engineering statistics, research, and construction, as well as of matters before Congress involving engineering considerations, will be furnished without charge by addressing M. O. Leighton, National Service Representative of Engineering Council, 502 McLachlen Building, Washington, D. C. This National Service Department of Engineering Council announces that its office at Washington is open to members of the Society at all times, and that accommodations can be had there at short notice for committee meetings of the Society, or of any organization in which the Society is interested, which may be held in Washington.

LABOR AND FINANCE AS AFFECTING ENGINEERS

"The Opportunity and Responsibility of the Engineer" was the subject presented at the Fortieth Anniversary of the American Society of Mechanical Engineers held in a crowded auditorium at the Engineering Societies Building on November 5th, 1920. Following short addresses by representatives of all the Founder Societies, including Henry R. Towne, Past-President, Am. Soc. M. E., Arthur P. Davis, President, Am. Soc. C. E., W. L. Saunders, for the Mining Engineers, in the absence of Herbert C. Hoover, President, Am. Inst. M. E., and Charles F. Scott, Past-President, Am. Inst. E. E., the three principal speakers of the evening were introduced by the Chairman, Fred J. Miller, President, Am. Soc. M. E. Owing to the unusually stimulating and interesting character of these principal addresses by J. Herbert Case, Acting Governor, Federal Reserve Bank of New York, Samuel Gompers, President, American Federation of Labor, and William B. Dickson, Vice-President, Midvale Steel and Ordnance Company, they are here reproduced, practically in full.

J. Herbert Case Compares Banking with Engineering

The following extracts from the address by J. Herbert Case, of the Federal Reserve System, indicate the principal points of resemblance dwelt on by the speaker in comparing modern banking with engineering, to show that the banker is now becoming a financial engineer.

"The Constitution of your Federated American Engineering Societies defines your profession 'as the science of controlling the forces and of utilizing the materials of nature for the benefit of man.' I should like you to think of banking as a profession with essentially similar aims. I conceive that our professions and our functions are not vitally different.

"More and more the banker is becoming, in a sense, a financial engineer and adopting essential engineering methods. I have hopes that in the future we shall be able to deal with banking and financial problems as concretely and with the same sureness and knowledge as the mechanical or electrical engineer does now with his problems.

"Ever since the banks took on the function of loaning money, this has been the intent. The engineer wishes first of all to know the strength of his materials. So, in a way, does the banker. But I think we are presently to go much further than this. The banker of the future will have a variety and definiteness of knowledge that the bankers of the past have not had. Moreover, he will endeavor to do exactly what the engineer endeavors to do in calculating the weight and size of his constructions. He will have to do with stresses and strains and the means of meeting them so that there shall be no breakage and the least possible friction.

"It has been the endeavor of more than a generation of thoughtful bankers and economists to devise a banking system which would meet periodic strains so that acute commercial or financial crises might be avoided, exactly as the engineer, for example, plans a bridge to meet every possible strain that can be put upon it, an unusually heavy load, a freshet, an unexpected hurricane, the ordinary dangers of fire and water. I think this endeavor has been successful. We have witnessed in the past few years a remarkable expansion in credits and during recent months a very remarkable fall in prices. I am not sure that it is not the most remarkable fall in prices, taken as a whole, of which we have any accurate record.

"Without wishing to exaggerate the fact, it is easy to see that these price declines in commodities, whose annual worth runs into billions of dollars, must in the aggregate have represented an enormous sum. What I wish to point out to you is that all this has taken place without any violent rupture or breakdown, such as has often characterized the past. And I want you to consider the reason why.

Why No Breakdown Need Be Feared.

"The reason why, as I see it, is that, taking a leaf from the basic principles of engineering, there has been introduced into our banking and financial system a greatly augmented factor of safety.

"We have approximately 10 000 of these Federal Reserve banks, representing 70% of America's banking assets, welded together into a coherent and smoothly-working system wherein, practically speaking, the resources of these 10 000 banks are more or less pooled, within reasonable limits, and in such a way as to enable them to meet almost any probable strain. Although these 10 000 banks are a trifle less than one-third of the total number, their resources are more than two-thirds of the total banking resources of the nation. Their aggregate deposits are in excess of $20 000 000 000, a fabulous sum even in these days. It is to my mind unthinkable that with 10 000 banks possessing such resources as these, welded

together, and pooling their reserves, there can be such a breakdown of our banking system as has come in the past.

"My vision goes even further than this. I see our whole banking and financial and currency systems so co-ordinated and so delicately adjusted to the demands of business that even severe commercial crises shall likewise be largely avoided. I foresee these systems so highly adapted, so well planned, that they will run on almost automatically. I can see our Federal Reserve System, and the currency system that goes with it, so developed that when the pace of business gets a little too fast, when American enthusiasm gets out of bounds, when the spell of making money rapidly gets the better of men's judgment, this system will almost automatically apply the brakes. And it will apply them, as I imagine, in time, so that perhaps the very high interest rates which we have at the present will no longer be needed. Perhaps some day a general rise in prices will automatically put a check upon credit expansion. It is conceivable that if we should have had a smooth acting governor automatically controlling our credit policies, the very rapid rise in prices last year might have been in part, at least, avoided and consequently the quite drastic declines that we are witnessing now.

"If, in our financial system, we can get a thorough-going introduction of engineering methods, adapted, of course, to financial and banking problems, I foresee a day when these periods of distress will be nearly if not completely eliminated. And I can see that this will do much more. If we can do away entirely with uninvited unemployment; if we can keep the vast industrial machine running like a wonderful Curtiss turbine, day in and day out, year in and year out; if we can get rid of these recurrent times of rising prices which affect so severely the cost of living and breed every kind of friction and irritation and discontent; and if, at the same time, we can get rid of periods of business depression, it seems to me that we ought to do away very largely with the prevalent social disturbances, unrest, and the insatiate impulse to try impossible schemes of social betterment.

"It ought to be pretty clearly evident that a man on an island can eat and have no more than he reaps and makes. What is true of the man on the island is equally true of a nation of a hundred millions, or of the whole wide world. Throughout the last half century the supply of goods, the total of products in this country, has increased at a rate very close to 4½% per annum. Our business crises and depressions have been very largely price cycles—if you like, very largely psychological. The vast business of production has gone on pretty much the same. This is the real foundation, I think, for the hope that the financial and banking engineer of the future may so adjust the credit machine that even these price waves and fluctuations, with their attendant dislocations and disasters, may be largely ironed out.

"In brief, gentlemen, I feel that the future is full of the richest sort of promise, financial and social as well as industrial. On the engineering side you have done a great and far-reaching work. You have given American engineers and American engineering the highest place in the world. You have set a wonderful, and, I may say, a difficult example to follow. What I wish you to know is that much the same ideas, much the same aims and methods, are at work now in the development of the Federal Reserve System of the United States."

Samuel Gompers Places Men Above Things as the Goal of Civilization

Speaking as the representative of labor, Samuel Gompers made a strong plea for co-operation between engineers and the labor movement and insisted that men, not things, are the goal of civilization. His address in full follows:

"The name engineer makes a very strong appeal to one who appreciates the mechanism underlying the fabric of our civilization. Engineers are scouts of civilization. We send them ahead into the lone places—the wilderness, the jungles, the great watery expanses—to build the highways necessary for civilized man. The engineers must deal with Nature, with that mysterious dynamic thing we call 'force', with materials. It is their function to direct the human activity necessary to co-ordinate these forces and materials in order to make them serve the needs and aspirations of men.

"Because of my high conception of the Engineering Profession, I was glad to accept your invitation to address the American Society of Mechanical Engineers to voice my understanding of the possibilities of your work as engineers of industry, and to suggest what seems to me the responsibility of the engineer to the whole modern industrial system.

"One of the difficulties that arises now-a-days about our discussion of responsibility is that we fail to realize that professional men, whether doctors, lawyers or engineers, should all be, in a very real sense, agents of society and not merely masters in their own particular professions.

"We are beginning to realize that just as no nation is isolated from the family of nations, so is it equally true that individually we cannot be isolated from our professions. Every man, in his actions, influences in a greater or less degree other groups or individuals, either for good or evil.

"During the past few months engineers have expressed their sense of responsibility in a splendidly stimulating way. In order to accomplish better their purpose of service to others and to contribute to public welfare the best that was in them, all the engineering and technical societies of the United States banded themselves together in a great over-arching organization designated as the Federated American Engineering Societies—a comprehensive organization dedicated to the service of the community, State and Nation. This close union makes possible co-ordination of effort and more efficient progress in the achievement of great ideals.

ENGINEERS SEEKING TO REALIZE IDEALS.

"But declarations are not deeds. Fortunately, evidences are not lacking that engineers are seriously seeking to realize the ideals they have formulated. During the past year representatives of engineering organizations as well as individual engineers have come to me, seeking help in getting a better understanding of the human element essential to production, and in establishing the proper basis for co-operation with the constructive force which they had come to realize exists in the organizations of human beings engaged in industrial production. For the engineer knows that organization is necessary in order to utilize power—human or material.

"It is a tremendously encouraging fact that the engineers throughout the country are coming to appreciate their high calling. It is unnecessary for me to

review the mechanical achievements of the engineer—they speak for themselves—but I do want to point out that one concept which has grown up in industry, which many accept, is fundamentally in error. We talk about the production of our factories as being the material, the finished product which is sent out in freight cars, and of the individual workmen as by-products. Men, not things, are the true goal of civilization. That civilization fails that does not produce great men and great women, able to create and to use with discernment the material things that serve the spirit. Who can estimate the worth of human beings? I submit that the true ethical point of view of production is that the man himself is the main product and the materials the by-product, and it is in this clearer point of view, it seems to me, that the way lies open for joining the forces which the labor movement represents and the forces represented by the activities of your own societies.

"The problem involved is not a simple one, for the tendency during the last 75 or 100 years of our Western civilization has been to have the machine replace the man. The old feeling of craftsmanship, which existed before the industrial revolution came about, has been greatly modified because of the perfection reached in machine design. This process, however, has been carried entirely too far, for in many places the man has become a human connecting link in a machine, and mastered by it instead of controlling the machine himself, as he did with the tools that he used in the old days. The result is that to-day men's work tends to become mere toil, so it seems to me that the task that lies before us is to develop a definite kind of working environment which will be attractive and which will inspire rather than repulse the workman. The work itself must become of central concern. This cannot be brought about unless the man finds the opportunity for self-expression in the day's work and a chance to exercise his creative impulses.

"During the past 50 years the labor movement has endeavored to protect the workman against the inroads of the machine upon his own life. Our fundamental effort toward this end we epitomized in this declaration: The labor of a human being is not a commodity or article of commerce. We knew that human labor is inseparable from thinking, living beings, but it took the organized power of our labor organizations to secure recognition of this principle in law and in practice. Workmen's Compensation Laws and other legislation of a similar nature are a recognition of this fundamental.

Engineer Should Join Hands with Labor.

"I see, however, before the labor movement a great future as I also see a great future before the Engineering Profession. If the engineer should join hands with the workman—both devoting their energies to one cause, namely the development of a kind of industry and a kind of work in which the man will not only learn the processes of production—each day will have increasing opportunities to develop those human functions which are essentially intelligent.

"A way has been opened for such co-operation in the declarations of the conventions of the American Federation of Labor, expressing appreciation of the

value of the technicians of industry and the desirability of the labor movement availing itself of scientific aid in all possible ways.

"In America our education has been both popular and free. We have had compulsory education for all because we wanted to be sure that all would be prepared for the duties of citizenship. Education, however, is nothing more than the acquiring of greater knowledge of natural law and an opportunity to use this knowledge in the performance of useful work. Is it not logical, therefore, to look forward to the day when our industries will be conducted along educational lines?

"It is the deadly monotony of repetitive work that is at the root of most of our troubles and I, therefore, in the name of the workers urge upon you engineers to direct your energies to the solution of this problem. Beware that the machines you create do not become a Frankenstein and enslave the human race.

"If you study the laws of humanity with the same degree of intensity that you study the laws of material science, you will render a tremendous service and, as President of the American Federation of Labor, it is my firm conviction that the labor movement not only welcomes, but invites, your co-operation."

Vice-President of Midvale Steel Company Favors Industrial Democracy

The address by William B. Dickson, of the Midvale Steel and Ordnance Company, which is reproduced nearly in full, laid great emphasis on the dangers of highly specialized industry, the tendency toward autocratic control, and the need for industrial democracy as the creed of the 20th Century.

"When your Committee invited me to take part in this discussion, I assume they knew that I was not an Engineer.

"In a long business experience, however, I have been identified with some large enterprises demanding the highest degree of technical skill. The usual procedure was for the non-professional members of the official staff to decide what was wanted in the shape of final product, and then turn the problem of securing results over to the engineering staff.

"I propose to handle my part of this discussion along somewhat similar lines, by pointing out what I consider some of the weak points in our social structure and some remedies, but leaving to you the part which your profession can play in meeting these problems.

"Most men will agree that our present social order is showing signs of instability. This is particularly true abroad, but we in America are not lacking in signs which point to a disturbed state of mind, especially on the part of workingmen. The authority of old standards and convention is being questioned, sometimes in such a manner as to take one's breath away. For instance, in the proposed Plumb Bill for handling the railroads.

"The term 'Mechanical' in the title of your Society, would seem, on first thought, to be essentially materialistic—'of the earth, earthy'—and therefore furthest removed from ethical problems. In the last two or three generations, however, mechanical developments have played such a large part in shaping our social order, that they have become an important factor in ethical problems.

"The question has been raised by thoughtful men, whether or not the applied sciences, progress in which is peculiarly the boast of our age, have really advanced

the human race in the path of evolution. I believe that they have, but, nevertheless, there are grave dangers attendant on modern conditions of work and living which must be recognized and counteracted, if American ideals are to be preserved as energizing factors in our civilization.

"About a year ago, in speaking to the Philadelphia branch of your Society, I dwelt on what I consider the menace of the highly specialized task in our modern factories. I am going to mention it again because I have been seeking light on it ever since, but without success. If I am wrong in my premises, I wish you would show me; if I am right, I would like to know the answer to the problem.

Danger in High Degree of Specialization.

"The danger to which I refer is the high degree of specialization in modern industry. The division of labor, which is such a marked characteristic of modern industry, has added a new complexity to the relation of employer and employee and has brought with it new problems which vitally affect the community life. I tried to draw a parallel between the village blacksmith and shoemaker, whom I knew as a boy in a country village in Western Pennsylvania, and their modern successors who operate the automatic machines in our factories.

"My point was that the old conditions furnished what I feel to be an essential factor in a normal life, that is, joy in work through the exercise of the creative instinct.

"It is difficult for me to associate this feeling with a highly specialized task where the workman performs a simple operation over and over, perhaps for years. I feel that the opportunity for the expression of the creative instinct in our modern factory is very limited. I am also convinced that the natural, inevitable effect on the individual of the deadly monotony of highly specialized factory work is to stunt him mentally, morally, and physically, unless it is counteracted by some other vital force.

"It is unthinkable that there should be any backward step in our industrial progress. No sane man would propose to solve this problem by reverting to the old conditions. Our shoes, clothing, and all other products essential to our present civilization will have to be made more and more by highly specialized automatic machinery. But if I am justified in my premises, there is a human problem which must be faced; and in my opinion, it is a problem, in the solving of which lies the question of the survival of our democratic ideals.

"It has been said that free government is more important than good government. I believe this to be a profound truth, and applying it to the form of government and admitting the manifest advantages of a concentrated governing class in securing a highly efficient social order, I would say that if there must be a choice, it is better to be free and inefficient than to secure efficiency by having men become mere cogs in a complex social machine operated by a so-called superior class.

"Efficiency in all lines of human endeavor is greatly to be desired, yet I fear that we are at present in danger of making a fetish of efficiency to such an extent as to endanger human freedom. It is a deadly menace in a people clothed with political power, but stunted in body and soul by their environment. As I said,

I have not been able to find a satisfactory, practicable answer to this problem, and I leave it with you.

The Supreme Issue To-day.

"The principal theme, however, to which I wish to direct your attention is a broader one, and in the working out of the social problem which I will present, I am hopeful that an answer will be found also for the problem of the specialized task.

"My theme is this: What is the supreme issue confronting mankind to-day? In my opinion, simply the same issue which runs back through all history, and which we have fondly dreamed was settled once and forever by the American people, namely, aristocracy *versus* democracy.

"We Americans are so accustomed to think of democracy as the normal system of human government, the very flower of civilization, that the man in our midst who would seriously question this apparently self-evident truth would be looked upon as abnormal, to say the least. We achieved, or we fondly hoped we had achieved, political democracy when Cornwallis surrendered at Yorktown. As a matter of fact, democracy is not an achievement; it is an opportunity for further struggle upward.

"We must now set our minds to the task of applying democratic principles to industrial relations.

"I believe there is a grave menace to our American ideals in the highly centralized, autocratic control which is becoming a marked tendency in our great industries. The feudal system was based on the ownership of land and its appurtenances—such as highways, mines, streams, fisheries, etc.—by the barons, and it was effective in securing autocratic control of the workers because the vast majority were tillers of the soil, or workers in other industries controlled through land ownership.

Tendency Toward Autocratic Control.

"The tendency of our modern industrial system is toward autocratic control of the workers through ownership of what our socialistic friends term 'the tools of production' which include not only the natural resources, but also the furnaces, mills, factories and transportation systems. Instead of indulging in glittering generalities, let me cite two instances of what has happened under the existing system of corporate control.

"Some years ago, a gentleman at the head of one of our great corporations decided that prices must be maintained in the face of a diminishing demand. In order to accomplish his purpose, he restricted production by shutting down a number of large plants located in different communities, each of which had been built up largely as an adjunct of the plant. Some of these plants were kept closed for about a year, and the result was disaster to the communities. The merchants were driven out of business, real estate values were depreciated, and the workers were thrown on their own resources and had to break up their homes and seek employment elsewhere. None of these persons had any voice in the momentous decision which was made in a New York office, and which resulted in social paralysis in all of these communities.

"This last summer the president of one of the largest textile companies sud-

denly announced that his mills would close for an indefinite period, and they were closed in the same arbitrary, autocratic manner previously described.

"History is filled with instances where centralized power has led to conditions inimical to human progress, as that term is usually understood in America. It is the effect of the unconscious insolence of conscious power. Consider, for a moment, the despotic power which our modern system of industry gives a few men over the lives and fortunes of hundreds of thousands of their fellow citizens. By reason of this condition, we have the unstable situation of a government founded on the suffrages of men who, for all practical purposes, are industrially bondmen.

"If we should read in the paper some morning that a Turkish Pasha had exercised his authority in such a way as to deprive a city of its means of subsistence, we would raise our eyes in holy horror and bless our good fortune in living in a more enlightened land.

"Any manifestation of autocracy is repugnant to the American people, whether it proceeds from a President of a corporation, a President of a labor union, or a President of the United States.

"What is the answer? Only one, namely, 'Industrial Democracy'.

"In a great national crisis, Lincoln said 'A house divided against itself cannot stand'; 'this nation cannot continue to exist half slave and half free.'

"I believe that we are approaching a time when we will need an industrial Lincoln, who will give utterance to the creed of the 20th Century; 'A house divided against itself cannot stand: this Nation cannot continue to exist politically democratic but economically autocratic.'

"What do I mean by industrial democracy? It is exceedingly important that there may be no confusion as to this definition. Mr. Carnegie was once asked 'Which is the most important factor in your business—capital, management, or labor?' He replied 'Which is the most important leg on a three-legged stool?'

The Creed of the 20th Century.

"This answer epitomizes my theme, and also what I believe will be the creed of the 20th Century.

"In an efficient partnership, such as Mr. Carnegie's answer implied, while each partner may have equal rights, the duties and responsibilities are usually separated so that each exercises his principal functions within his own limited sphere. But where grave questions are to be considered, which vitally affect the organization as a whole, there is general consultation.

"So, in the new ideal of industrialism, each factor, that is, capital, management, and labor, will continue to have its own separate natural function, as heretofore, but no arbitrary, autocratic decisions affecting the general welfare will be made, either by the directors, the officials, or by the workmen.

"One of the most melancholy tasks of the student of history is to observe the insidious ways in which free institutions have been destroyed under the guise of apparently innocent innovations. Rome, after a glorious history as a republic, extending over nearly five centuries, became an empire under the Caesars, and as far as outward forms were concerned, the transition was so gradual that the citizens did not realize that any real change had occurred. This was so apparent that Julius Caesar, himself, did not dare to accept the title of King.

"So, to-day, I am not imputing blame to any man or class. No man has deliberately said, even to himself, 'I will deprive my fellow citizens of a large measure of liberty in order to enrich myself;' nevertheless, the things which lead to this condition have been done, and are being done to-day as we look on.

"As a famous American has said: 'The essential characteristic of empire, in the objectionable sense, is absolutism. Whether or not absolute power be administered benevolently, makes no difference. The evil is in the power itself; not in the nature or manner of its administration. Benevolent absolutism is, indeed, the most fruitful seed of tyranny. Let absolutism begin malignantly and a people accustomed to freedom recognize it for what it is, and rising up in their might, put it down; but let it begin benevolently, and by the time the people see and feel the tyranny, which is as natural to every species of absolutism as poison to a poison vine, they are powerless to resist aggressions.'

Obligation to the Human Element in Industry.

"When a man, or a number of men, for their own ends, create a great industrial unit, they assume an obligation toward the human elements in that unit, and through them to society in general, which cannot be cancelled or suspended arbitrarily. I subscribe to the doctrine that human labor is not a commodity in the ordinary sense of that term.

"In a completely natural society, every man by reason of close and continuous contact with land and other natural resources would be an independent, self-sustaining unit. When a man has left this natural condition, whether voluntarily or otherwise, and has become the servant of another man, or other men, he has given up a natural right and his employer has assumed an equivalent obligation. The fact that neither the employer nor the employee has been conscious of this exchange, and that both may have acted from purely selfish motives, does not alter the elemental fact, which, in the great national aggregate, constitutes the great unanswered problem of modern times—the elemental fact that is at the base of all social unrest.

"In the two instances which I cited, where communities were paralyzed by the arbitrary closing of plants, the American way to handle such a situation would be to have a conference of the representatives of the three factors, that is, capital, management, and labor, which, after considering all the facts, would determine whether to shut down, operate part time, reduce wages and salaries, or adopt any other course which would give the fullest recognition to the human factors involved.

"I believe that the greatest task to which American employers must address themselves is the devising of practical ways in which labor can be given the full recognition to which, as an equal partner, it is entitled. I make this statement with absolute confidence in the fair-mindedness of the American workingman when he is fully informed and is entirely free to act. If I did not have this confidence, I would despair of the future of our free institutions.

"In an address delivered by me in 1915, I said 'The individual workman, dependent on his own strength and resources, cannot hope to bargain on equal terms with the corporation. If he cannot do so, he is no longer a free man, but a serf; and the serf has no place in the future of America.'

"I believe, therefore, that one of the first steps necessary to inspire the workman with confidence is the sincerity of the employer's recognition of the proper status of labor, is the adoption of a fair system of collective bargaining.

"I also believe that in the near future the workmen must become partners through some system of profit-sharing. No scheme could be adopted which would be applicable to all business, as each particular company would have to adapt the general idea to its own peculiar conditions.

"I will not enlarge on this idea, which is too important to dismiss lightly, except to say that in any such partnership, while the economic needs of the human factors must always be recognized in preference to property rights, the workmen must have a real stake in the enterprise, probably through the investment of his savings in the stock.

Social Relations Are Dynamic, Not Static.

"But, some of you may say 'We don't want to have anything to do with your so-called industrial democracy; we are satisfied with the present system and prefer to continue as we are.'

"My answer to this is that human relations are not static, but dynamic, and unless I am entirely mistaken as to the direction and force of the tide which is now running so strongly in human affairs, your choice will not lie between the present system of industrial control and industrial democracy. American industry has come to the parting of the ways. On the right is the road that leads direct to industrial democracy. This road has some heavy grades, and a higher degree of skill will be required to drive on it, but it will bring us out into Peace Valley. On the left is a road also deviating from the old road by which we have come, but it is cunningly camouflaged so as to seem to be the natural continuation of the main highway. It leads directly to industrial feudalism; to that social condition predicted by Hilaire Belloc in his book 'The Servile State', in which the workers voluntarily sacrifice freedom in return for comfortable maintenance and safety.

"From this second road, there is also a by-path which is now being trodden by Russia, and toward which not only our British brethren, but a considerable number of American workmen are being tempted to stray. In other words, the choice lies between democracy on one hand, and serfdom or chaos on the other.

"Let me again quote Andrew Carnegie, who in his 'Problems of To-day' said: 'Revolutionary Socialism is successfully to be combatted only by promptly conceding the just claims of moderate men.'

"To sum up, what can be done to counteract the tendencies which I have described? These things seem to me to be entirely practicable:

"1st.—Place our industries on a more democratic basis, giving recognition to management and labor as equal partners with capital;

"2d.—Teach democracy in our schools and colleges as thoroughly as we teach arithmetic, so that it will permeate every phase of human life, politically and industrially.

"It is a constant source of wonder to me to find so many persons in all walks of life who have no real conception of the vital principles of democracy.

"Life, in its truest and most virile sense, consists largely in making choices, and, like the traveler before the Sphinx, we must answer correctly or be destroyed.

"I am not looking forward to the new era of industrial democracy as a period of peace and serenity, but rather as a time in which the way has been cleared for a further toilsome climb up the spiral of evolution.

"I am hopeful that our generation will guess the Sphinx riddle, and 'out of this nettle, danger, will pluck the flower, safety'."

Progress in Re-cataloguing the Engineering Societies Library

As the Engineering Societies Library had its origin in the separate libraries of the four Founder Societies, each of which had developed along its own lines and with its own ideals, it was found that the methods of classifying the books and cataloguing them for use were so dissimilar that a revision was necessary. The Library Board therefore decided, early in 1919, to re-catalogue all the material in order to make more convenient for members the use of the collection and to gain assurance that all the material available on any given subject could easily be found. A special corps of workers has been assembled, and every effort has been made to adopt methods that will provide for future developments, as well as meet present needs. This has been done at some sacrifice of speed, in the belief that basic soundness is the prime quality.

At present approximately one-fourth of the work is done. The re-catalogued material includes all the publications of the past four years, and those classes of the older material most in use. Work on the other material is proceeding class by class, the most important being treated first.

During the year from September, 1919, to October, 1920, 23 204 books, representing 5 000 titles, have been completely catalogued, and 31 679 volumes have been handled. The detail figures are as follows:

Volumes:	
New volumes catalogued	2 194
Old volumes re-catalogued	21 010
Volumes added to existing records	2 499
Duplicate volumes listed	4 676
Volumes withdrawn from the Library	1 300
Total volumes handled	31 679
Additions to the new catalogue:	
Titles represented	5 000
Subjects represented	10 301
Catalogue cards added	26 637
Index	9 052
Cards:	
Cards typed	43 024
Library of Congress cards used	10 769
Total cards filed in official and public catalogues	53 793

Results to be Gained by Re-cataloguing.

By the re-cataloguing, the varying methods of cataloguing and classifying formerly used by the Societies are being eliminated, bringing the collection together into a logical whole. Much of the material handled by the cataloguing staff can-

not be called re-cataloguing, because many classes of books now in the Library have not, up to this time, been represented in the catalogue. Such difficult work as the cataloguing of the State and Federal documents is quite new to this Library. Some of the most valuable material covering such subjects as Mining, Geology, Foreign Trade, Water Supply, Road Engineering, etc., is to be found in the reports and bulletins issued by State Surveys, Commissions and Experiment Stations. Publications emanating from the various Bureaus are being analyzed and made available for the first time.

Unlike an alphabetical catalogue, the classified catalogue now in process can be used and printed by subject. It is so arranged that one class, such as Hydraulic Engineering, is complete in itself and is not scattered under Pumps, Dams, Water Flow, etc.—an alphabetical index takes care of Pumps, Dams and Water Flow, while the whole class of Hydraulic Engineering remains as a unit. Should a smaller class be needed, such as Dams, this will also be found to be a complete unit.

The weak spots in the collection will be revealed and records furnished for filling in the gaps. Until the books are combined under one classification it is quite impossible to see wherein the Library is weak.

It is expected to establish a system of classifying engineering literature which can be applied not only to books but also to the indexing of periodicals. An alphabetical key to the classification is being created, which will enable any engineer to index his own library, and his own periodicals, by the most approved international method at a minimum cost.

New York City Increases Compensation of Engineering Employees

Arthur S. Tuttle, M. Am. Soc. C. E., Chairman, Engineering Council's Committee on Classification and Compensation of Engineers, reports that under a recent general readjustment of salaries of municipal employees in the City of New York the compensation for all positions carrying a salary of less than $7 500 per annum has been increased. In the case of salaries of less than $1 500 the increase is at the rate of 22%, with a minimum of $200. In the case of salaries ranging from $1 500 to $2 500 per annum, the increase is 20 per cent. To salaries upwards of $2 500 per annum $500 has been added, but salaries plus increases have been limited to a maximum of $7 500.

The effect of these increases upon the compensation of the engineering force of the City as organized near the close of 1919 is shown in the table below, which

Position	Number of Employees.	Average Salary, July 1st, 1915.	Average Salary, After Aug. 20, 1920.	Percentage Increase.
Chief Engineers (including Deputy Chief Engineer)	20	$7 270	$7 450	2
Engineers	50	3 850	4 470	16
Senior Assistant Engineers	86	2 850	3 420	20
Assistant Engineers	171	2 180	2 760	27
Junior Assistant Engineers	56	1 630	2 370	45
Senior Aids (Chief Instrumentmen and Chief Draftsmen)	64	1 700	2 440	44
Aids (Instrumentmen and Draftsmen)	285	1 500	2 180	45
Junior Aids (Junior Draftsmen and Rodmen)	150	1 030	1 720	67

also gives a comparison with the average compensation for the same positions as fixed before the shrinkage in the value of the dollar became pronounced. All the positions are classified on the basis recommended by Engineering Council's Committee.

Comparing the present average compensation with the compensation schedule proposed by Engineering Council's Committee, it will be seen that the average pay of Junior Aids and Junior Assistant Engineers under this scale is substantially greater than that tentatively recommended; that the average compensation for Aid is practically the same as that proposed by the Committee; that the average compensation for Senior Aid and Assistant Engineer is very close to the Committee's minimum; and that for the grades of Senior Assistant Engineer, Engineer, and Chief Engineer, the average salary, after the allowed increases have been added and notwithstanding the appreciable betterment in the lower grades, is still approximately $650 to $1 500 per annum below the minimum compensation proposed by the Committee.

American Engineering Standards Committee

At a meeting of the American Engineering Standards Committee on October 9th, 1920, the following new members were admitted by unanimous vote:

The U. S. Department of the Interior, with three representatives; the Gas Group, comprising at present the American Gas Association, the Compressed Gas Manufacturers' Association, and the International Acetylene Association, with three representatives; the American Electric Railway Association, with one representative at present, but with the understanding that this may be increased to two or three if it later seems advisable.

The Joint Committee on Safety Codes submitted four recommendations which were unanimously approved, as follows:

That the U. S Bureau of Standards and the Society of Automotive Engineers be requested to assume joint sponsorship for an "Aviation Safety Code"; that the American Society of Heating and Ventilating Engineers be requested to assume sponsorship for a code on "Ventilation"; that the Electrical Safety Conference be designated as sponsor for a safety code on "Electrical Power Control"; that in view of the time which has elapsed since the preparation of the 1917 "Foundry Safety Code" by the American Foundrymens' Association and the National Founders' Association, and of the progress in safety practices in the meantime, that it be suggested to these sponsor bodies that it is desirable to organize a sectional committee to approve or revise this code before it is approved by the American Engineering Standards Committee.

The following action regarding nomenclature of standards was taken by unanimous vote:

"*Whereas:* The terms 'Tentative American Standard' and 'Recommended American Practice' more accurately express the meaning intended to be conveyed by the terms 'Tentative Standard' and 'Recommended Practice', and

"*Whereas:* The latter terms conflict with long established practices of important organizations, be it

"*Resolved:* That the American Engineering Standards Committee will approve standards as either 'Recommended American Practice' or 'Tentative American Standard', or 'American Standard', and will authorize the use of these terms in the publication of standards approved by it."

ACTIVITIES OF ENGINEERING COUNCIL

Council Approves Uniform Registration Law as Revised

Engineering Council at its meeting held in Chicago, on October 21st, 1920, adopted a revised form of the proposed uniform registration law* for architects, engineers and surveyors submitted by its Committee on Licensing of Engineers, T. L. Condron, M. Am. Soc. C. E., Chairman. The changes in the uniform law in its revised form, as adopted by Council, aim to make it satisfactory to the American Institute of Architects by incorporating those features recommended by the Joint Committee of Engineering Council and the Institute of which F. C. Shenehon, M. Am. Soc. C. E., is Chairman.

A proposed revision allowing practice by those who do not represent themselves to be architects or engineers was not incorporated in the law, but is included as an appendix (Exemption 8, Section 13) with a note of explanation stating that it is not advocated by Engineering Council. The modifications of the proposed law agreed upon in consultation with the Chairman of the Joint Committee are briefly as follows:

1.—Transposing into alphabetical order the terms architect, engineer and land surveyor.

2.—Omitting the adjective "professional" before "engineer" and "engineering."

3.—Providing that persons practicing these professions at the time the law goes into effect may continue so to practice without registration.

4.—Extending the time from fifteen days that a non-resident may practice in a State without registration to thirty days.

5.—Providing that a non-resident may practice without registration as a consulting associate of a resident registered architect, engineer or land surveyor.

The report of the Committee and the final form of the Recommended Uniform Law for Registration of Architects, Engineers and Land Surveyors follow:

REPORT BY COMMITTEE ON LICENSING OF ENGINEERS, OCTOBER, 1920.

"There has been no general meeting of this Committee since the report of December, 1919, but there has been correspondence between the Chairman and several members of the Committee, as well as a meeting of the Chicago members of the Committee held on September 29th, 1920, to consider whether or not it was desirable to suggest any changes in the recommended uniform registration law submitted to Council in December, 1919. It was the opinion of the members attending this meeting that no changes should be recommended.

"The Chairman has received a number of communications from engineers expressing approval of the proposed law, and but very few criticisms. These criticisms are covered by the following:

"1.—*Omission of Definitions.*—Definitions were not included in the proposed law as explained in note (*a*) accompanying the same.

"2.—*Qualifications of Board Members* including 'he shall be a member in good standing of a recognized society of architects or professional engineers.' It should be noted that this requirement applies only to those appointed as members of a 'State Board of Registration.' This cannot be deemed class legislation, as the requirement is general and there are numerous societies of architects and of engineers. Members of such a board should be men who have attained recognition among their professional brethren.

* *Proceedings*, Am. Soc. C. E., January, 1920, p. 32.

"3.—*Administration.*—The proposed law has been drawn to meet the usual method of State administration of such laws. In a few States, Departments have been created to function instead of Boards, but the matter of administrative detail must necessarily be modified in each State in accordance with the practice in that State, and therefore this recommended law is intended to be only suggestive so far as the matter of administration is concerned.

"4.—*Qualification for Registration.*—Many expressions of approval have been received of the provision that certificates be issued to persons submitting evidence satisfactory to the Board that they are qualified to practice rather than of dependence entirely upon examinations. In the State of Illinois, submission of evidence will be substituted in the place of examinations, following the scheme included in our proposed law.

"5.—*Citizenship.*—Criticism of the requirement of the proposed law concerning citizenship has been received, principally from mining engineers, but the Committee was unanimous last December in requiring that registration be limited to citizens of the United States or Canada, or to those who have made declaration of their intention to become citizens of the United States and who speak and write the English language. (See comments on exemptions).

"6.—*Significance of Certificate.*—The provisions of Sections 11 and 12 make it perfectly clear that separate and distinct certificates will be issued for registration of architects, of engineers, and of land surveyors. Of course, if an applicant could qualify and desired to qualify in each of the three professions, there is nothing to prevent three certificates being issued to such an applicant. It should be borne in mind that while Section 12 provides that a registered architect shall not be excluded from practicing engineering nor a registered engineer excluded from practicing architecture, there is no provision that would permit a registered land surveyor practicing either architecture or engineering. It seems unnecessary to add, as has been suggested, the further provision that a registered architect may not style himself an engineer, and *vice versa.*

"7.—*Exemptions.*—In order better to provide for occasional activities of foreign engineers called into consultation or practice in a State, we would recommend that the time limit in Exemption No. 2 be changed from fifteen days to thirty days, and further that an exemption be added providing that non-residents may practice, without registration, as consulting associates. This would make it legal for a consulting engineer to act in the capacity of consultant in association with a resident registered engineer in any locality without the consulting engineer being obliged to secure a certificate of registration in that particular locality.

"8.—*Explanatory Notes.*—In giving publicity to the recommended uniform registration law, the notes (*a*) to (*t*) inclusive, should be printed in the text as in the original report of our Committee published by Engineering Council.

"Respectfully,

"Committee on Licensing of Engineers,
(Signed) "T. L. CONDRON, *Chairman.*"

RECOMMENDED UNIFORM LAW FOR REGISTRATION OF ARCHITECTS, ENGINEERS AND LAND SURVEYORS.

Title.—An Act to regulate the practice of the professions of architecture, engineering and land surveying.

[Note: (*a*) In certain States further amplification of title may be required by law.]

[Note: (*b*) The brief terms "architecture", "engineering" and "land surveying" give simpler and clearer understanding of the activities affected by this Act than any definition. Such definitions as have been devised have proven academic, difficult of proper inclusion and exclusion, confusing, laborious and frequently of great length.]

[Note: (*c*) Laws for the registration of architects and engineers must be either in parallel or in common. Assuming the best interests of each to lie in co-operation, and having in mind economical administration of a law, both are included in this Act. Surveying is a function of engineering, but land surveying deals with land measurements involving property rights.]

The People of the State of.....enact:

Section 1.—In order to safeguard life, health and property, any person practicing or offering to practice as an architect, a professional engineer or a land surveyor in this State shall hereafter be required to submit evidence that he is qualified so to practice, and shall be registered as hereinafter provided, and from and after six months after this Act becomes effective, it shall be unlawful for any person to practice or to offer to practice in this State, as an architect, a professional engineer, hereinafter called engineer, or a land surveyor, except under the provisions of this Act.

[Note: (*d*) The constitutionality of this law is based on its promoting the public welfare by safeguarding life, health and property.]

Section 2.—Nothing in this Act shall be construed as requiring registration by an individual, firm or corporation for the purpose of practicing architecture or engineering on property owned or leased by said individual, firm or corporation, unless the same involves the public safety or health; nor as requiring registration by any person, who prior to the time of the passage of this Act was engaged in the practice of architecture, engineering or land surveying; provided, however, such person shall not represent himself as, or use the title of "Registered Architect", "Registered Professional Engineer" or "Registered Land Surveyor" unless such person is qualified by registration under this Act.

[Note: (*e*) Obviously no modern agriculturist should be prohibited from laying out and building the ditches or roads on his farm, or planning and building his own barn.]

Appointment of the Board.

Section 3.—To carry out the provisions of this Act there is hereby created a State Board of Registration for architects, engineers and land surveyors, hereinafter called the "Board", consisting of seven members, who shall be appointed by the Governor within sixty days after this Act becomes effective. Three members shall be registered architects and three members shall be registered engineers and one member shall be a registered land surveyor. Not more than one member of said Board shall be from the same branch of the profession of engineering. The members of the first Board shall be appointed to serve for the following terms: Two members for one year; two members for two years; two members for three years, and one member for four years; said terms ending on the first day of .....of the succeeding years. On the expiration of each of said terms, the term of office of each newly appointed or reappointed member of the Board shall be for a period of four years and shall terminate on the first day of ..... Each member shall hold over after the expiration of his term until his successor shall have been duly appointed and qualified. The Governor may remove any member of the Board for misconduct, incompetency

or neglect of duty. Vacancies in the membership of the Board, however created, shall be filled by appointment by the Governor for the unexpired term.

[Note: (*f*) In those States in which there already exists a Department of Education and Registration or other similar department, as in the case of New York, Illinois and Idaho, it is desirable that registration laws should be administered by such State departments with the aid of professional commissions in each profession. Where such State departments do not exist their formation should be encouraged.]

QUALIFICATIONS OF THE BOARD.

Section 4.—Each member of the Board shall be a citizen of the United States and a resident of this State at the time of his appointment. He shall have been engaged in the practice of his profession for at least ten years and shall have been in responsible charge of work for at least five years. He shall be a member in good standing of a recognized society of architects, engineers or land surveyors, and except as provided in Section 5, shall be a registered architect, a registered engineer or a registered land surveyor.

CERTIFICATES, PRIVILEGES AND POWERS OF THE BOARD.

Section 5.—Each member of the Board shall receive a certificate of appointment from the Governor, and before beginning his term of office he shall file with the Secretary of State the constitutional oath of office. Each member of the Board first created shall receive a certificate of registration under this Act from the Governor of the State. The Board or any committee thereof shall be entitled to the services of the Attorney General, in connection with the affairs of the Board, and the Board shall have power to compel the attendance of witnesses, may administer oaths and may take testimony and proofs concerning all matters within its jurisdiction. The Board shall adopt and have an official seal which shall be affixed to all certificates of registration granted; and shall make all by-laws and rules not inconsistent with law needed in performing its duty.

ORGANIZATION AND MEETINGS OF THE BOARD.

Section 6.—The Board shall hold a meeting within thirty days after its members are first appointed, and thereafter shall hold at least two regular meetings each year. Special meetings shall be held at such times as the by-laws of the Board may provide. Notice of all meetings shall be given in such manner as the by-laws may provide. The Board shall elect annually from its members a chairman, a vice-chairman and a secretary. A quorum of the Board shall consist of not less than four members, of whom two shall be architects and two engineers.

RECEIPTS AND DISBURSEMENTS.

Section 7.—The secretary of the Board shall receive and account for all moneys derived from the operation of this Act and shall pay them to the State Treasurer, who shall keep such moneys in a separate fund to be known as the "Fund of the Board of Registration for Architects, Engineers and Land Surveyors", which fund shall be continued from year to year and shall be drawn against only for the purposes of this Act as herein provided.

Each member of the Board shall receive ..... dollars ($.....) per day for attending sessions of the Board or of its committees,

and for the time spent in necessary travel, and, in addition, shall be reimbursed for all necessary traveling, incidental and clerical expenses incurred in carrying out the provisions of this Act. All expenses certified by the Board as properly and necessarily incurred in the discharge of its duties, including authorized compensations, shall be paid out of said fund on the warrant of the auditor of the State issued on requisitions signed by the chairman and the secretary of the Board; provided, however, that at no time after this Act shall have been in effect for one year shall the total of warrants issued exceed the total amount of funds accumulated under this Act. The secretary of the Board shall give a surety bond satisfactory to the State Treasurer conditioned upon the faithful performance of his duties. The premium on said bond shall be regarded as a proper and necessary expense of the Board.

[Note: (*g*) The per diem allowance of each member of the Board is not expected to be adequate compensation. High-grade professional men are expected to serve as a matter of good citizenship.]

[Note: (*h*) The administration of the law is made ultimately self-supporting. The Legislature is not expected to appropriate money to accomplish the results contemplated.]

Records and Reports.

Section 8.—The Board shall keep a record of its proceedings and a register of all applicants for registration showing for each, the date of application, name, age, educational and other qualifications, place of business and place of residence, whether or not an examination was required and whether the applicant was rejected, or a certificate of registration granted, and the date of such action. The books and register of the Board shall be *prima facie* evidence of all matters recorded therein. A roster showing the names and places of business and of residence of all registered architects, engineers and land surveyors shall be prepared by the secretary of the Board during the month of.....of each year; such roster shall be printed out of the funds of the Board as provided in Section 7. On or before the ..... day of ..... of each year the Board shall submit to the Governor a report of its transactions for the preceding year, together with a complete statement of the receipts and expenditures of the Board, certified by the chairman and the secretary, and a copy of the said roster of registered architects, registered engineers and registered land surveyors. A copy of this report shall be filed with the Secretary of State.

Applications for and Issuances of Certificates.

[Note: (*i*) The application required should include a complete statement of an applicant's education and a detailed summary of his technical work. The statements made should be under oath, and should be supported by the recommendations of not less than two members of his profession.]

Section 9.—The Board shall, on application therefor on prescribed form, and the payment of a fee of ..... dollars ($.....), issue a certificate of registration as an architect or as an engineer, and on the payment of a fee of ..... dollars ($.....) issue a certificate of registration as a land surveyor:

1.—To any person who submits evidence satisfactory to the Board that he is fully qualified to practice architecture, engineering or land surveying; or

2.—To any person who holds a like unexpired certificate of registration issued to him by proper authority in the District of Columbia, in any State or territory of the United States, or in any province of Canada, in which the requirements for the registration of architects, engineers or land surveyors are of a standard satisfactory to the Board;

Provided, however, that no person shall be eligible for registration who is under twenty-five years of age, who is not a citizen of the United States or Canada, or who has not made declaration of his intention to become a citizen of the United States, who does not speak and write the English language, who is not of good character and repute, and who has not been actively engaged for six or more years in architectural, engineering or land surveying work of a character satisfactory to the Board. However, each year of teaching, or of study satisfactorily completed, of architecture or engineering in a school of architecture or engineering of standing satisfactory to the Board, shall be considered as equivalent to one year of such active engagement.

[Note: (*j*) The functions of the Board are largely administrative and judicial. The burden of presenting evidence of qualification is placed upon the applicant. The Board may in doubtful cases give technical examinations; but the clear intent is to utilize other State agencies, as for instance the architectural or engineering schools, to submit as evidence the results of examinations, with recommendations as to competency.]

Unless disqualifying evidence be before the Board, the following facts established in the application shall be regarded as *prima facie* "evidence, satisfactory to the Board", that the applicant is fully qualified to practice architecture, engineering or land surveying:

[Note: (*k*) When the law goes into effect a large percentage of practicing architects, engineers and land surveyors will be registered to preserve the *status quo*. Long-continued practice, graduation from a technical school of approved standing with subsequent years of practice, or membership in a high-grade technical society, in the absence of disqualifying facts, is accepted as *prima facie* evidence of qualifications, as stated below.]

(*a*) Ten or more years of active engagement in architectural, engineering or land surveying work;

(*b*) Graduation, after a course of not less than four years in architecture or engineering, from a school or college approved by the Board as of satisfactory standing, and an additional four years of active engagements in architectural, engineering or land surveying work;

(*c*) Full membership in the American Institute of Architects, American Institute of Chemical Engineers, American Society of Civil Engineers, American Institute of Electrical Engineers, American Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers, Society of Naval Architects and Marine Engineers, or such other National or State architectural or engineering societies as may be approved by the Board, the requirements for full membership in which are not lower than the requirements for full membership in the professional societies or institutes named above.

Applicants for registration, in cases where the evidence originally presented in the application does not appear to the Board conclusive or warranting the issuance of a certificate, may present further evidence, which may include the results of a required examination, for the consideration of the Board.

[Note: (*l*) The standard of qualification is set high for two reasons: The public welfare will be better promoted by maturer competency; and the prestige attaching to the term "Registered" will be more significant for the professional men themselves. In requiring the younger, less experienced men to serve somewhat longer as assistants or understudies to older men, no hardship is imposed which will not be compensated by the fuller return in recognition when registration is achieved.]

In determining the qualifications of applicants for registration as architects, a majority vote of the architect members of the Board only, shall be required; in determining the qualifications of applicants for registration as engineers, a majority vote of the engineer members of the Board only, shall be required; and in determining the qualifications of applicants for registration as land surveyors the affirmative vote of the land surveyor member and of one engineer member of the Board only shall be required.

[Note: (*m*) The acceptance for registration of architects by the architects on the Board, and of engineers by the engineers on the Board, places the judicial finding of fitness or unfitness in the hands of those best qualified to judge. In administrative matters and in the revocation of certificates, the Board acts as a unit.]

In case the Board denies the issuance of a certificate to an applicant, the registration fee deposited shall be returned by the Board to the applicant.

Certificates of registration shall expire on the last day of the month of December following their issuance or renewal and shall become invalid on that date unless renewed. It shall be the duty of the secretary of the Board to notify by mail every person registered hereunder of the date of the expiration of his certificate and the amount of the fee required for its renewal for one year; such notice shall be mailed at least one month in advance of the date of the expiration of said certificate. Renewal may be effected at any time during the month of December by the payment of a fee of.....dollars ($.....) for architects and engineers, and.....dollars ($.....) for land surveyors, to the secretary of the Board. The failure on the part of any registrant to renew his certificate annually in the month of December as required above shall not deprive such person of the right of renewal thereafter, but the fee to be paid for the renewal of a certificate after the month of December shall be increased 10% for each month or a fraction of a month that payment for renewal is delayed; provided, however, that the maximum fee for a delayed renewal shall not exceed twice the normal fee.

[Note: (*n*) The amount of the fee to be paid by a registrant must be established by each State in the light of the number of fees to be expected, and the cost of administration.]

REVOCATION AND REISSUANCE OF CERTIFICATES.

Section 10.—The Board shall have the power to revoke the certificate of registration of any architect, engineer or land surveyor registered hereunder who is found guilty of any fraud or deceit in obtaining a certificate of registration or

of gross negligence, incompetency or misconduct in the practice of architecture, engineering or land surveying. Any person may prefer charges of such fraud, deceit, negligence, incompetency or misconduct against any architect, engineer or land surveyor registered hereunder; such charges shall be in writing and sworn to by the complainant and submitted to the Board. Such charges, unless dismissed without hearing by the Board as unfounded or trivial, shall be heard and determined by the Board within three months after the date on which they are preferred. A time and place for such hearing shall be fixed by the Board. A copy of the charges, together with a notice of the time and place of hearing, shall be legally served on the accused at least thirty days before the date fixed for the hearing, and in the event that such service cannot be effected thirty days before such hearing, then the date of hearing and determination shall be postponed as may be necessary to permit the carrying out of this condition. At said hearing the accused shall have the right to appear personally and by counsel and to cross-examine witnesses against him and to produce evidence and witnesses in his defense. If after said hearing five or more members of the Board vote in favor of finding the accused guilty of any fraud or deceit in obtaining a certificate, or of gross negligence, incompetency or misconduct in the practice of architecture, engineering or land surveying, the Board shall revoke the certificate of registration of the accused.

The Board may reissue a certificate of registration to any person whose certificate has been revoked, provided five or more members of the Board vote in favor of such reissuance for reasons the Board may deem sufficient.

The Board shall immediately notify the Secretary of State and the clerk of each county, town and city in the State of its findings in the case of the revocation of a certificate of registration or of its reissuance of a revoked certificate of registration.

[Note: (*o*) Revocation is recognized as a serious procedure in its effect on professional reputation, and the right of hearing and contest is recognized and provided for.]

A new certificate of registration to replace any certificate lost, destroyed or mutilated, may be issued, subject to the rules and regulations of the Board. A charge of one dollar shall be made for such reissuance.

SIGNIFICANCE OF CERTIFICATE—SEALS.

Section 11.—The issuance of a certificate of registration by this Board shall be evidence that the person named therein is entitled to all the rights and privileges of a registered architect, a registered engineer or a registered land surveyor while the said certificate remains unrevoked or unexpired.

Each registrant hereunder may upon registration obtain a seal of the design authorized by the Board, bearing the registrant's name and the legend "Registered Architect", "Registered Professional Engineer", or "Registered Land Surveyor". Plans, specifications, plats and reports issued by a registrant may be stamped with the said seal during the life of registrant's certificate, but it shall be unlawful for any one to stamp or seal any decuments with said seal after the certificate of the registrant named thereon has expired or has been revoked unless said certificate shall have been renewed or reissued.

UNLAWFUL ACTS AND PENALTIES.

Section 12.—Any person who after this Act has been in effect six months is not legally authorized to practice as an architect, an engineer or a land surveyor in this State according to the provisions of this Act and shall so practice, or offer so to practice in this State, except as provided in Section 13 of this Act, and any person presenting or attempting to file as his own the certificate of registration of another, or who shall give false or forged evidence of any kind to the Board, or to any member thereof, in obtaining a certificate of registration, or who shall falsely impersonate any other practitioner, of like or different name, or who shall use or attempt to use an expired or revoked certificate of registration, shall be deemed guilty of a misdemeanor and shall for each such offense of which he is convicted be punished by a fine of not less than one hundred dollars ($100) nor more than five hundred dollars ($500), or by imprisonment for three months, or by both fine and imprisonment. However, nothing in this Act shall be construed as excluding any registered architect from the practice of engineering or as excluding any registered engineer from the practice of architecture.

[Note: (*p*) This Act not only gives prestige to the titles "Registered Architect", "Registered Professional Engineer" and "Registered Land Surveyor", but also prohibits in part the practice as principals of persons not registered.

[Note: (*q*) This Act does not prohibit an architect from designing a bridge, nor an engineer from designing a building. Ethical considerations and professional opinion will confine the scope of each person's practice to the fields in which he is a master.]

EXEMPTIONS.

Section 13.—The following shall be exempted from the provisions of this Act:

1.—Offering to practice in this State as an architect, an engineer, or a land surveyor, by any person not a resident of and having no established place of business in this State.

[Note: (*r*) A professional card in a journal of National circulation is an "offer to practice" in any State in the Union. It would be manifestly unfair to compel a professional man to register in every State in which he may in this way, or by letter or otherwise, express his readiness to accept an engagement.]

2.—Practice as an architect, an engineer or a land surveyor in this State by any person not a resident of and having no established place of business in this State, when this practice does not aggregate more than thirty days in any calendar year; provided, that said person is legally qualified for such professional service in his own State or country.

[Note: (*s*) It is a distinct advantage to the people of any State to be able to call in for consultation a specialist from any other State. Such practice may be brief, and often of an emergency nature.]

3.—Practice as an architect, an engineer or a land surveyor in this State by any person not a resident of and having no established place of business in this State, or any person resident in this State, but whose arrival in the State is recent; provided, however, such person shall have filed an application for registration as an architect, an engineer, or a land surveyor and shall have paid the fee provided for in Section 9 of this Act. Such exemption shall continue for only

such reasonable time as the Board requires in which to consider and grant or deny the said application for registration.

4.—Engaging in architectural, engineering or land surveying work as an employee of a registered architect, a registered engineer or a registered land surveyor, or as an employee of an architect, an engineer or a land surveyor, authorized by Paragraphs 2 and 3 of this Section, provided that said work may not include responsible charge of design or supervision.

5.—Practice of architecture, engineering or land surveying by any person not a resident of, and having no established place of business in, this State, as a consulting associate of an architect, an engineer or a land surveyor registered under the provisions of this Act; provided the non-resident is qualified for such professional service in his own State or country.

[Note: (*t*) This includes a reciprocal privilege accorded to non-resident or alien consultants, in order that resident architects, engineers and land surveyors may receive similar privileges of practice in other States and in foreign countries.]

6.—Practice of architecture, engineering or land surveying solely as an officer or as an employee of the United States.

7.—Practice of architecture, engineering or land surveying solely as an employee of this State or any political subdivision thereof, at the time this Act becomes effective and thereafter only until the expiration of the then existing term of office of such employee.

Corporations or Partnerships.

Section 14.—A corporation or partnership may engage in the practice of architecture, engineering or land surveying in this State, provided the person or persons connected with such corporation or partnership in responsible charge of such practice is or are registered as herein required of architects, engineers and land surveyors, or is or are otherwise authorized to practice. The same exemptions shall apply to corporations and partnerships as apply to individuals under this Act.

Public Work.

Section 15.—One year after this Act goes into effect, neither the State nor any county, township, city, town or village nor other political subdivision of the State, shall engage in the construction or maintenance of any public work involving architecture or engineering for which the plans, specifications and estimates have not been made by, and the construction and maintenance supervised by, a registered architect or a registered engineer; provided, that nothing in this section shall be held to apply to such public work wherein the contemplated expenditure for the completed project does not exceed two thousand dollars ($2 000).

Land Surveying.

Section 16.—Land Surveying as covered by this Act refers only to surveys for the determination of areas or for the establishment or re-establishment of land boundaries and the subdivision and platting of land. Nothing in this Act shall be construed as prohibiting registered architects or registered engineers from making land surveys where such surveys are essential to architectural or engineering projects.

REPEAL OF CONFLICTING LEGISLATION.

Section 17.—All laws or parts of laws in conflict with the provisions of this Act are hereby repealed.

[Note: (*u*) The laws of most States contain rules for the construction of statutes which provide that words importing the masculine gender apply also to the feminine gender. In States where such rules of construction do not exist, a section may be incorporated in this Act to include women in all its provisions.]

APPENDIX.

SUPPLEMENTAL PROVISION, SECTION 13—EXEMPTION 8.

The following additional Exemption 8, under Section 13, while not advocated by Engineering Council, has been recommended by the Joint Committee on Co-operation of the American Institute of Architects and Engineering Council. It is suggested for incorporation in the laws of States where such a provision seems necessary or desirable. Its inclusion would permit any person, for example, a contractor, a carpenter, a road master or a manufacturer to plan and execute work of an architectural or engineering nature, provided that there was no implication involved that such a person is an architect or an engineer.

Section 13.—Exemption 8.—Designing or executing work of an architectural or engineering character by a person not an architect or an engineer; provided that such person does not represent himself as an architect or as an engineer; and provided further that on drawings, specifications or other documents prepared or issued by such person the title Architect or Engineer shall not be used, nor any other title which might imply that such person is an architect or an engineer.

Appeal to Members for Aid in Restoration of Parts of Nolan Patent Office Bill

Engineering Council at its meeting on October 21st, 1920, adopted a resolution offered by Edwin J. Prindle, Chairman of the Patents Committee, urging the restoration to their original values of the figures for the examining and clerical forces of the Patent Office in the Nolan Patent Office bill, H. R. 11 984. It requests that its constituent bodies ask their memberships to communicate with their Representatives and Senators in Congress to urge action in accordance therewith, and to the Hon. John R. Nolan and Senator George W. Norris, Chairmen respectively of the Patent Committees of the House and Senate. Members of the Society are therefore urged to comply with this request; the fact that letters may have already been sent at an earlier stage in the passage of this Bill will not serve the present emergency, because the question now is not merely its passage but the restoration of the figures which have been so seriously cut down by the Senate.

The resolution in full, as passed by Council, follows:

"*Whereas:* The United States Patent Office is vitally important to our industries, to induce the production of scientific and technical improvements and to enable our industries to keep abreast of those of other countries; and

"Whereas: The volume of work of the Patent Office for many years has increased much more rapidly than its examining and clerical forces have been increased, and the work in the past fiscal year has increased 36% above the work of the previous year; and

"Whereas: The salaries of examiners, except for a war bonus, have been increased only 10% in over 70 years and are so low that resignations of examiners are constantly occurring in a steady stream, averaging 25% per annum, and resulting in such frequent changes that much inefficiency unavoidably results therefrom, even where examiners are qualified for the work, and many men are necessarily employed as examiners who cannot pass the examination required to qualify for their positions, and the salaries of the clerical force are considerably below the average of salaries for corresponding work in the Governmental departments generally; and

"Whereas: As a result of such situation, the Patent Office is at such a great disadvantage that it unavoidably grants an undue proportion of defective patents, resulting in heavy losses both to the inventors and the public, due to useless development and unnecessary litigation, and the Patent Office is so far behind in its work that the value of many transactions with it is greatly reduced and in some instances destroyed by the delay; and

"Whereas: As a partial remedy for such situation, Nolan Bill H. R. 11 984 was introduced into Congress providing for an increase in the examining corps of the Patent Office of but 5.8% and an increase in the clerical force of but 3.9%, and providing increases in the salary for the position of primary examiners from $2 750 to $3 900 and of assistant examiners in proportion, and providing increases in the salaries of the clerical force only to bring them up approximately to the average corresponding salaries of other governmental departments and bureaus, and as the cost of the increased salaries and force of the said Nolan Bill was more than met by an increase in the fees for patents provided therein; and

"Whereas: The United States Senate so amended the said Nolan Bill that, instead of increasing, it decreases the examining corps by 15.7% and reduces the clerical force by about 1% below the present insufficient numbers of said examining corps and clerical force actually employed in the Patent Office, as well as reduces the salaries both of the examining and the clerical forces as fixed by the House of Representatives, so that the total present payroll is reduced 5.9%, notwithstanding that the increase in the fees for patents, which were made to provide funds for the increased force and salaries, were retained in the bill; and

"Whereas: In the opinion of Engineering Council, the general effect of the changes in force and salaries made by the Senate would amount to a catastrophe for the Patent Office; and

"Whereas: The salary of $3 900 provided in the bill as it passed the House of Representatives is low for the position of Principal Examiner when compared with the salaries paid by private corporations and other employers for engineers having a similar grade of responsibilities and requirements—that is, engineers required to make and assume responsibility for final decisions in important matters and to have highly technical knowledge—especially as such examiners must have both legal and technical knowledge, and notwithstanding allowance must be made for the fact that Governmental salaries are not as high as those paid by private interests, and the salaries for other grades of examiners are low in proportion,

"Now, Therefore, Be It Resolved: That Engineering Council, representing 45 000 engineers, regards it of large importance that the numbers of the examining and clerical forces for the Patent Office and the salaries therefor in Nolan Patent Bill, H. R. 11 984, be restored to those in the bill as it passed the House of Representatives; that the bill be freed from any riders such as Section 9 thereof, which may delay or jeopardize its passage, and that the bill be made a law at the earliest possible date."

Members of Engineering Societies on Public Service Commissions

A study recently completed by Engineering Council reveals that of 170 Commissioners on State Public Service or other Regulatory Commissions, only 6 of the total number, or 3.5%, are members of any of the four Founder Societies or the Society of Automotive Engineers.

This result checks with information from another source, which shows that 5 of 146 Commissioners are members of a National Engineering Society.

EUROPEAN NOTES

The following notes relative to reconstruction, etc., in Belgium and France, and industrial progress, etc., in Great Britain and elsewhere, have been contributed by W. E. Woolley, Assoc. M. Am. Soc. C. E., of London, England, who is also a Corresponding Member of the Société Centrale d'Architecture de Belgique.

War Damage to House Property in Belgium

Official statistics have been published dealing with the destruction of house property in Belgium during the War. Out of a total of 687 502 houses which existed in 1914, 68 901 have been entirely destroyed and 11 000 rendered uninhabitable.

West Flanders suffered most; out of a total of 106 721 houses, 41 301 were entirely destroyed and 4 245 rendered uninhabitable. In this Province many towns have been completely destroyed—Ypres, 3 170 houses; Dixmude, 934; Nieuport, 870; Comines, 1 440; Moorslede, 1 481; Staden, 1 099; Ploegstreert, 1 030, etc. Roulers lost one-quarter of its 5 239 houses, while at Wervicq (near Ypres), out of 2 054 houses one-quarter are completely destroyed and three-quarters made uninhabitable.

In the other provinces, destruction has not been on such an extensive scale, but some towns have suffered considerably. Thus, in East Flanders, out of 2 115 houses at Termonde, 1 292 were entirely destroyed and 889 made uninhabitable. In Brabant Province, Aerschot had 1 616 houses, of which 348 were destroyed and 40 made uninhabitable; Louvain, out of 8 719 houses, 833 and 7; and Capelle-au-Bois, out of 525 houses, 240 and 7. In the Province of Namur, Dinant has out of 1 653 houses, 897 destroyed and 45 uninhabitable; Surice, 130 destroyed out of 172; Sorinne, 115 out of 120; Spontin, 131 out of 156 and 3 uninhabitable; Willerzee, 129 destroyed out of 150; Onhaye, 114 out of 148 and 25 uninhabitable. In the Provinces of Luxembourg, Hainaut, Antwerp and Liége, similar destruction was wrought, the exact figures not being here reproduced in detail.

Rebuilding in Devastated Areas

During a recent visit to Belgium, the writer had ample opportunity of observing the rebuilding work which is in progress. An enormous amount is at present being carried out and, moreover, the workmen are really working hard. A fair amount of work is being carried out at Ypres, while at Louvain many buildings have been re-erected and are now occupied, and many others are nearing completion.

The station square has been renamed "Place des Martyrs" and in many towns several streets have been renamed, such as "Avenue des Alliés" at Louvain, "Avenue Lloyd George" and "Boulevard Adolphe Max" at Brussels, "Avenue Maréchal Foch" at Schaerbeek, etc.

Thousands of men are at work clearing away débris in the devastated regions, and practically the whole of the railway and light railway systems are in good working order. Nearly all the roads in this area have been repaired and are in good condition. About 80 local societies are in course of formation for the erection of working class dwellings.

Building Exhibition at Ghent, 1921

An International Architectural and Building Exhibition will be held during the spring of 1921 at Ghent, in the large hall of the Palais des Fetes, under the auspices of the Belgian Government, in conjunction with the Provincial and Town Councils, for a period of two months.

Meetings of Architects and Builders will take place, and further particulars can be obtained on application to the Administration, Exposition du Batiment, Coupure 15, Ghent, Belgium.

Power Transmitted by Liquid Wave Motion

A new method for the commercial transmission of power, called wave transmission or sonic transmission, is rapidly passing beyond the experimental stage. Following experiments begun in 1914, it was applied during the World War to the automatic firing of guns on the fighting aeroplanes. Recently W. H. Dorman and Company, Limited, which turned out 30 000 of these equipments for aeroplanes, has designed a series of tools embodying the new principle.

Essentially, this new wave transmission principle consists in the utilization of wave motions or pulsations set up in an enclosed column of liquid, usually water. This liquid is contained in a pipe leading from the apparatus generating the wave motions to the machinery which applies them to useful work.

Although apparently similar to hydraulic transmission, the underlying principle of wave transmission is entirely distinct. The latter takes advantage of the elasticity of water or other fluids for the purpose of transmitting energy. Experiments clearly indicate that the new principle may with advantage be applied to a large range of tools and machines in many industries.

BRIEF NOTES

The resources of all the banks in the United States have broken all records, exceeding the combined bank assets of all the other leading nations of the world. The U. S. Comptroller of the Currency announces a total of $53 000 000 000 as assets in National and State banks, savings banks, trust companies and private banks.

W. S. Murray, Chief Engineer of the Superpower Survey, states that by the development of waterways in the East between Washington and Boston, and the conversion of the energy of rivers and streams into horse-power, an annual

saving of $300 000 000 to manufacturers and railway companies could be accomplished. Prof. J. W. Dorsey, of the University of Manitoba, Winnipeg, Man., Canada, has presented a plan whereby hydro-electric power might be used for domestic purposes.

The Illinois Agricultural Association states that a Grain Marketing Committee of seventeen, represented and ratified by farm organizations, is the first definite step of all the farmers of America to create a grain marketing system which will eliminate speculation and stabilize prices. The Committee is divided into five Sub-Committees to make special studies of co-operative marketing methods, cost of marketing, storage and transportation, consumption and export, and finance.

The National City Bank, of New York City, issues a statement on coal which says in part: "The United States is now the world's largest coal exporter. Prior to the war it ranked third among coal exporters of the world, exports in the year immediately preceding the war having been slightly less than 20 000 000 tons, against 76 000 000 tons exported by Great Britain and approximately 30 000 000 tons by Germany. In eight months ending with August, 1920, the latest date for which detailed figures are available, exports of coal were, in round terms, 23 000 000 tons, while those of Great Britain were, in the same period, but 18 375 000 tons and those of Germany far less than those of either the United States or Great Britain."

The two years and two months of Federal control of the railroads of the United States cost the tax-payers $902 000 000, according to latest returns. The Government loaned the carriers for capital account $1 149 617 393, of which $124 953 170 has been repaid. By the terms of the Transportation Act under which the rail carriers were returned to private control, the standard return, based on average net railway operating income for the years 1915, 1916, and 1917, was continued for six months—March 1st to September 1st, 1920. Assuming that the Interstate Commerce Commission, in the final accounting, will allow all the maintenance charges reported by the carriers in that period, only six months of private operation cost the tax-payers $634 000 000—that is, the deficit in operations, in round numbers—or more than two-thirds of the cost for the two years and two months of Federal control. Reducing these figures to costs per month, there is obtained about $34 700 000 per month under Federal control, and $105 700 000 per month since the return to private control.

ACTIVITIES OF LOCAL SECTIONS*

Special Meetings and Regular September Meeting of Colorado Section

A special meeting, preceded by a dinner to which the members of all the Engineering Societies in Denver, Colo., were invited, was held at the Adams Hotel on August 25th, 1920, at which President Oliver T. Reedy presided; 15 members of the Section and about 40 members of other Societies were present. President Arthur P. Davis addressed the meeting on the organization and purposes of the proposed Federated American Engineering Societies.

The 113th regular meeting of the Colorado Section was held at the Shirley Hotel, Denver, Colo., on September 29th, 1920, President Reedy in the chair; 10 members and 3 guests present. Mr. Freeman reported for the Committee on the "Marne Memorial", and it was moved, seconded and carried that the Secretary be instructed to formulate and send to the members of the Section a request that each subscribe $1.00 to this memorial.

In response to an invitation from the American Society of Mechanical Engineers requesting the Section to participate in a Joint Meeting of all the Local Sections of the Founder Societies in Denver, Colo., to be held on November 5th, 1920, it was moved, seconded and carried that the invitation be accepted. It was further moved, seconded and carried that the regular October Meeting of the Section be omitted, and a Special Meeting be called to discuss the question whether the American Society of Civil Engineers should become a Charter Member of the Federated American Engineering Societies.

The proposed amendments to the Constitution of the Parent Society were read and separately discussed, but no action was taken.

Proposed amendments to the Constitution of the Colorado Section substituting the word "Section" for "Association" were read.

Upon motion, duly seconded and carried, the Secretary was instructed to communicate with the Utah, Nebraska, and other Sections in District No. 10 stating that a number of members of the Colorado Section are suggesting the name of Robert Campbell Gemmell to represent the district on the Nominating Committee, and urging the members of those Sections to vote for Mr. Gemmell to represent that district.

The meeting then adjourned to join the Colorado Society of Engineers in an adjacent room. Mr. H. C. Boyden, of the Portland Cement Association, read a paper on "Concrete", describing a number of experiments and results obtained by D. A. Abrams in the laboratory of the Lewis Institute. The paper, illustrated by lantern slides, included a discussion of water content, organic impurities, proper curing, re-gauging and interesting phases of the tests of concrete aggregates.

Proposed Federation Discussed at Special Meeting.

A special meeting of the Colorado Section held on October 20th, 1920, President Oliver T. Reedy in the chair and 7 members present, discussed the question of the Parent Society joining the Federated American Engineering Societies. All those present took part in the discussion, but no action was taken.

It was also decided to take no action in support of any particular member as a candidate for the Nominating Committee to represent the district, but it was

* For list of Local Sections, Officers, Meetings, etc., see page 875.

the opinion of those present that Mr. R. C. Gemmell should continue to receive the support of the members, even though the Utah Section was advocating the support of Mr. W. R. Armstrong. It was ordered that a copy of the letter from Mr. A. B. Villadsen expressing the high esteem in which Mr. Gemmell is held by the Utah Section be sent to the Board of Direction of the Society.

A communication from Acting Secretary H. S. Crocker in regard to uniform letter-heads for all Local Sections was read.

Southern California Section Favors Joining State Council and National Federation

The regular meeting of the Southern California Section, held at the University Club, Los Angeles, Cal., on October 13th, 1920, with 30 members and 13 guests present, voted unanimously in favor of joining in the formation of the State Engineering Council, and also unanimously approved of the proposal that the American Society of Civil Engineers become a Charter Member of the Federated American Engineering Societies.

President W. K. Barnard presided, and introduced the speaker of the evening, Mr. H. W. Dennis, who presented a paper entitled "A Study of Stream Flow, with Particular Reference to a Comparison Between the Flow as Observed at Two Separate Points on the Kern River: A Method for Adapting the Records of Flow at One Point to Another Point Upon the Same Stream", illustrated by lantern slides showing the results of his studies. The great interest in these investigations and studies was shown by the general discussion which followed, and by the many questions asked.

Letters from Mr. H. L. Doolittle, Secretary of the Joint Committee for the formation of the California Engineering Council, urging prompt action by the Section, and from Mr. C. H. Snyder, of the San Francisco Engineering Council, were read. After discussion, on motion by Mr. W. S. Post, duly seconded and unanimously carried, the members present voted to join in the formation of the California Engineering Council.

Mr. George G. Anderson spoke on the proposed Federated American Engineering Societies, and appealed for an affirmative vote on the questionnaire in regard to affiliation of the Parent Society with the Federation. On his motion, duly seconded and unanimously carried, the meeting approved the proposal "that the American Society of Civil Engineers become a Charter Member of the Federated American Engineering Societies." The Secretary was instructed immediately to notify the Secretaries of all Local Sections of the Society of this action.

Mr. H. Hawgood gave a detailed résumé of the recent ballot on the amendments to the Constitution of the Society. He also called attention to the efforts of certain individuals to remove from office State Engineer W. F. McClure, and stated that this effort had selfish motives, reading, in this connection, a letter from Mr. Walter L. Huber, of San Francisco. It was unanimously voted to refer this matter to the President and officers of the Section, with power to take such action as they see fit.

President Barnard referred to the proposal of the Portland Cement Association, presented to him by Mr. A. S. Bent, in regard to the preparation of standard specifications for cement concrete pipe. The proposal called for the assistance of

members of the Section to co-operate in the preparation of such specifications. On motion, duly seconded and carried, the President was empowered to appoint a committee to co-operate with the Portland Cement Association in this matter. President Barnard appointed the following: Messrs. E. R. Bowen, E. A. Bayley, J. A. Griffin, G. C. Fitzgerald, and F. G. Dessery.

Mr. Anderson read an appeal to the Society membership to be circulated in the interest of an affirmative vote on the question of affiliation with the Federated American Engineering Societies, and asked those who approved this movement to sign the appeal.

Annual Meeting of Detroit Section—New Officers Elected

At the Annual Meeting of the Detroit Section, held at the Fellowcraft Athletic Club on October 8th, 1920, preceded by a dinner participated in by 37 members and 4 guests, the following officers were elected to serve for the ensuing year:

President, David A. Molitor; Vice-Presidents, Edward M. Walker and Edward D. Rich; Secretary-Treasurer, Dalton R. Wells.

Mr. D. J. Sterrett, Past-President of the Detroit Engineering Society, and delegate of that Society to the Organizing Conference of the Federated American Engineering Societies held in Washington, D. C., gave a clear and definite account of the purposes of the Federation and what was accomplished at the Conference. He read the written report which he had submitted to the Detroit Engineering Society, after the receipt of which that Society had voted unanimously to join the Federation.

Mr. Harry M. Nimmo, Editor of the Detroit *Saturday Night,* presented in his usual interesting manner a subject which he called "Fried Potatoes", having much to do, as he put it, with Domestic Engineering. Touching on the "Back-to-the-Farm" movement, Mr. Arthur H. Blanchard gave an instructive and interesting talk on highway engineering and highway transport. Mr. Gardner S. Williams spoke on the advisability of the American Society of Civil Engineers joining the Federated American Engineering Societies, but no action was taken. The newly elected officers were then introduced to the members present.

Duluth Section Visits New Coal Dock

All regular business was dispensed with at the meeting of the Duluth Section held at noon on October 18th, 1920, in order that the 20 members and 6 guests present might have ample time for the scheduled visit to the Coal Dock of the Northwestern Fuel Company, at Garfield Avenue, Duluth.

Mr. G. H. Hutchinson, Chief Engineer of the Company, at whose invitation the trip was made, gave a short description of the new dock and its equipment, including the steel coal-handling bridge, with turn-table trolley. Mr. W. H. Smith spoke briefly on the capacity of the bridge and the various screening and loading devices in connection therewith, stating that the dock has a storage capacity of 400 000 tons of bituminous coal and 100 000 tons of anthracite coal. The meeting then adjourned to make the trip to the dock by automobiles.

New York Section Has Comprehensive Programme

The New York Section has announced for the season of 1920-21 a series of discussions which will have to do with the engineering problems of the Metro-

politan District in connection with its future development. These discussions will consider not only the technical side of these problems but also the economic, financial, construction and operating aspects. Several of the leading civic and commercial associations in New York have evinced a lively interest in the work the Section has undertaken, and are planning to contribute to the discussions. It is the hope of the Section that these discussions may point the way to the adoption of a Metropolitan District Plan that will effect a logical and orderly development of the community that surrounds the waters of New York Harbor.

At the regular meeting held on October 20th, 1920, the first of these discussions, treating of the "Local Distribution of Freight and Food Products" was opened by Col. Charles D. Hine and was continued by Col. Frederick A. Molitor and Messrs. J. Shirley Eaton, Eugene Porter, Fred Lavis, W. C. Brinton, B. F. Fitch, W. Bleecker Miller, E. C. Church and others. There was an attendance of more than 200 members and guests. Owing to the Section rule providing for 20-min. opening discussion and 10-min. continuing discussions, the meeting adjourned before 10:30 P. M.

The programme as it has been outlined for the remainder of the season is as follows:

November 17th, 1920.—"Urban and Suburban Passenger Transportation." Henry M. Brinckerhoff to introduce the subject, followed by George Gibbs, J. Vipond Davies, L. B. Stillwell, F. J. Sprague, D. L. Turner, G. A. Harwood, Frank Hedley, W. S. Menden, R. E. Danforth, and George McAneny.

December 15th, 1920.—"The Port of New York." B. F. Cresson to introduce the subject, followed by George S. Webster, F. W. Cowie, E. P. Goodrich, Murray Hulbert, Frank L. Williams, G. F. Nicholson, Geo. T. Hand, F. L. Stuart, J. J. Mantell, A. W. Robinson, John Meigs, P. A. S. Franklin, Irving T. Bush, and F. T. Chambers.

January 12th, 1921.—"Water Supply and Sanitation." Dr. George A. Soper to introduce the subject, followed by Allen Hazen, Geo. W. Fuller, A. D. Flinn, Edward Hatch, Jr., Geo. C. Whipple, Wm. W. Brush, J. R. Freeman, M. R. Sherrerd, J. Waldo Smith, and Merritt H. Smith.

February 16th, 1921.—"Light, Heat and Power." William Barclay Parsons will introduce the subject. This will be a Joint Meeting, and additional speakers will be determined after consultation with the Local Sections of other Societies.

March 16th, 1921.—"Streets and Parks." C. W. Leavitt to introduce the subject, followed by N. P. Lewis, A. W. Brunner, Samuel Parsons, F. D. Gallatin, F. S. Greene, C. W. Baker, T. J. Wasser, F. H. Bethell, and Amos Schaeffer.

April 20th, 1921.—"Military Features." Meeting to be held jointly with the New York Post of the Society of American Military Engineers, with which arrangements will be made as to speakers.

May 11th, 1921.—"Bridges and Tunnels." W. H. Burr to introduce the subject, followed by G. Lindenthal, C. M. Holland, James Forgie, J. Vipond Davies, J. A. L. Waddell, J. F. O'Rourke, Ralph Modjeski, H. C. Baird, W. S. Kinnear, A. W. Brunner, and Henry Bacon.

Unless announcement to the contrary is made later, all these meetings will be held in the Engineering Societies Building, 33 West 39th St., New York City.

ENGINEERING SOCIETIES SERVICE BUREAU

Engineering Societies Service Bureau, established December 1st, 1918, as an activity of Engineering Council, is managed by a board made up of the Secretaries of the four Founder Societies, funds for its maintenance being provided by these Societies. The Bureau is co-operating with engineering organizations in all parts of the country. It is desirous of increasing such co-operation by working with local engineering associations and clubs. Members of the American Society of Civil Engineers who desire to register with this Bureau should apply for further information, registration forms, etc. to Walter V. Brown, Manager, Engineering Societies Service Bureau, First Floor, Engineering Societies Building, 29 West 39th Street, New York City. In order to be included in the list published in *Proceedings,* copy must be received on or before the first Wednesday of each month. All communications should be addressed to Mr. Brown.

EMPLOYMENT BULLETIN

POSITIONS AVAILABLE

THREE ENGINEERS with asphalt experience, both in roofing and road making. Application by letter only, giving details of experience. Three men needed—one for South America and West Indies, must speak Spanish; one for India, Australia and Africa; one for China, Japan and Philippines, must speak Spanish. Must have sales experience. Z-2336.

U. S. CIVIL SERVICE EXAMINATIONS

Apply for Form 1312, U. S. Civil Service Commission, Washington, D. C., stating title of examination desired.

JUNIOR ENGINEER AND DECK OFFICER, U. S. Coast and Geodetic Survey, examination December 8th and 9th, 1920; entrance salary $2 000 per year, increased to $2 240 after one month if service is satisfactory. About 50 vacancies to be filled from eligibles resulting from this examination, after a probationary period of six months or more, including commissioned officers ranging from ensign in the Navy at about $2 500 to Captain at about $6 900 per year. Subjects and weights: (1) mathematics, including trigonometry, analytics, mechanics, and calculus, 15; (2) practical computations, 20; (3) modern language, 10; (4) astronomy, especially determination of latitude, longitude, time, and azimuth, and use of field instruments, 20; (5) physics—optics, magnetism, etc., 15; (6) surveying, plane and geodetic, 20. Time allowed, two days of six hours each; (1), (2), and (3) on the first day and (4), (5), and (6) on the second. Slide rule allowed, and logarithmic tables furnished. Prerequisite: Graduation from college, university, or technical school of recognized standing with degree of B. S. in Civil Engineering, or C. E. Physical Examination required, also photograph on day of examination.

SENIOR ENGINEER, Grade 2, C. E., E. E., M. E., Signal, Structural, Telephone, and Senior Architect. Salary, $2 500 and bonus.

SUPERINTENDENT OF CONSTRUCTION, applications to close December 7th, 1920. Salary, $2 500 to $3 000.

MEN AVAILABLE

CIVIL ENGINEER, graduate, age 32, 10 years' experience in design, construction and estimating reinforced concrete buildings, harbor works, bulkheads, piers, etc., desires position with contractor or consulting engineer. CE-1.

CIVIL ENGINEER, age 55, thirty years' experience on large variety of work, mostly construction, all kinds of masonry in water, temporary works, foundations. Hydro-electric, water supply, irrigation, designs, estimates, reports. At present employed. Available on short notice. CE-2.

ENGINEER with broad executive experience with Government on improvements of rivers, harbors and terminals. Six years Chief Engineer and Purchasing Officer of large city and two years engaged upon street pavement and highway construction. Member, Am. Soc. C. E. and American Water-works Association. CE-3.

EXECUTIVE, age 33, married, graduate C. E., 1910. Member, Am. Soc. C. E. and Am. Inst. M. E. Experience as general engineer, administrative commercial, foreign developments and negotiations. Has traveled throughout world, principally Far East and South America. Would consider investing in business. Open for all or part time. Eastern interview. Salary and references in conference. CE-4.

INDUSTRIAL ENGINEER—EXECUTIVE, at present assistant to President of well-known industrial engineering company. Five years' successful experience as industrial engineer, following valuable experience in other lines of engineering work. Graduate civil engineer, Assoc. M. Am. Soc. C. E., M. Am. Inst. M. E. Successful in present location, but seeking connection offering bigger opportunities. Location desired New York. CE-5.

GRADUATE CIVIL ENGINEER, with twenty-five years' practical experience in water terminal improvements, city improvements, dredging construction and operation, shipping by rail and water, including extensive experience in all classes of river and harbor improvements, seeks a change in associations. CE-6.

CIVIL ENGINEER, graduate of Cornell, ten years' experience in structural and ornamental iron, reinforced concrete, building and general construction. Experience embraces drafting, inspecting, designing, estimating, cost analysis, purchasing, job supervision, and office management. CE-7.

TECHNICAL GRADUATE, fourteen years' experience; competent to design or superintend the construction of hydro-electric developments, sewers, water systems, factory or warehouse buildings. Assoc. M. Am. Soc. C. E. Hydro-electric work; prefer location New England. Salary $400 month. CE-8.

CIVIL ENGINEER, age 36, married, desires position as executive with manufacturing plant as Engineer of Maintenance and Construction. Four years' experience in these lines with large industrial plant. References. Least salary $4 500 per year. Location immaterial. CE-9.

ENGINEER with long experience of extraordinary breadth in technical and executive work. Record embraces works of importance in civil, hydraulic, and mechanical branches in several countries. Spanish spoken fluently, some French; read Spanish, French and Portuguese. Special experience in investigations and reports on water-supply and power projects, and heavy construction. Good organizer, active and aggressive. CE-10.

CIVIL ENGINEER, twenty years' experience, several years in charge of design and construction of tunnels, steel structures, buildings and rapid transit railroads. CE-11.

CHIEF DRAFTSMAN, OR ASSISTANT CHIEF ENGINEER, desires responsible position with progressive company. Has specialized in the design, installation and operation of high and low pressure air, oxygen, hydrogen, acetylene and gas compressors. Experienced in testing and erecting. CE-12.

GRADUATE CIVIL ENGINEER, 1907, age 36, unmarried. Speaks Spanish. About 14 years' experience, U. S., Panama, Alaska, Mexico and South America, in railroad location and construction, reinforced concrete design and construction, etc. Assoc. M. Am. Soc. C. E. Experience qualifies as resident engineer or superintendent on construction, or engineering designer. CE-13.

GRADUATE CIVIL ENGINEER, ten years' experience in construction, operation and management of large water power and irrigation company in California. Age 36. Would consider foreign engagement. Available December 1st. CE-14.

CONSTRUCTION ENGINEER, Superintendent or Works Manager, 18 years' experience in charge of $15 000 000 worth of work including subways, foundations, underpinning of buildings, reconstruction of subsurface structures, heavy sewer construction, waterworks, hydro-electric plant, concrete dam. Practical engineer. Not a graduate. Age 40. Location immaterial. Prefer salary and percentage basis depending on size of job. CE-15.

CONSTRUCTION ENGINEER, technical graduate, age 35, four years' railway engineering and ten years' office and field work in responsible positions on design and construction railway and industrial shops and plants. Officer of Engineers, U. S. Army, for two years. CE-16.

GRADUATE CIVIL ENGINEER, desires position with engineering or contracting firm as designing or construction engineer on highways, water or sewer systems or assistant to consulting engineer on hydraulic and sanitary work. CE-17.

APPRAISAL ENGINEER, valuation and reports on public utilities, piers and wharves, power plants, chemical plants. Design and construction of chemical and industrial plants, piers and wharves, steel and concrete structures. Fine executive and organizer. Seeks responsible position as Chief Engineer, or in charge of valuation. CE-18.

ENGINEER CONSTRUCTOR, 11 years' experience on construction, design and contracting. Now employed as engineer on large hydraulic-fill dam and structures for flood protection. References from present and former employers, looking for a real job; salary, not experience, is the object. Interview solicited. CE-19.

CIVIL ENGINEER, graduate, age 33, with varied experience in engineering and superintendence. Most skilled along dock-building, concrete foundation, and road construction lines. Have handled men and organized jobs. Available at once, for any place. CE-20.

CONTRACTING ENGINEER, graduate Civil Engineer, age 36. Has been in business as civil engineer and contractor since 1911. Served in American Expeditionary Forces. Specialist in water-works, sewerage, and roads. Member, Am. Soc. C. E. Desires position with contractor. CE-21.

SUPERINTENDENT OF CONSTRUCTION, graduate Civil Engineer; age 39; 18 years' experience in construction field, comprising dams, docks, difficult foundation structures, and hydro-electric construction. CE-22.

CONSTRUCTION ENGINEER, 20 years' broad experience, principally in charge of construction of railway, tunnel, hydro-electric, and sewer work and reinforced concrete work of all kinds. Has made investigations and written reports. Speaks Spanish and Portuguese. Age 42. Member, Am. Soc. C. E. Will go anywhere. CE-23.

EXAMINATIONS FOR ENGINEERS' LICENSES

For the convenience of the membership, abstracts of the examination requirements of all States in which engineers are now required to obtain licenses before being allowed to practice, together with the addresses of the officers to whom application must be made, are repeated from the complete abstracts of the various laws now in force, as published in the October, 1920, *Proceedings*, as follows:

Colorado.—Each candidate is examined in that branch of engineering in which he is proficient, as set forth in his application. The Board conducts the examination in such manner as it deems best suited to determine the fitness of candidates, and it may summon any licensed engineer to assist in preparing for and in conducting examinations. Fee for examination is $10.00, for license certificate $5.00, and for renewal certificate, $5.00 annually. Application for examination is made to State Engineer, Secretary, State Board of Engineer Examiners, Denver, Colo.

Florida.—The Board has ruled that examinations may consist of the applicant's sworn statement of professional education and experience in responsible charge of engineering work. If this statement is not complete or qualifying, the Board may summon the applicant to appear for further examination, and investigate his record of professional service. Examinations may be either oral, or partly oral and partly written. Fee for examination is $15.00, for certificate of registration $10.00 additional, for registration without examination $25.00, and for renewal of certificate, $5.00 annually. Application for examination is made to the Secretary, State Board of Engineering Examiners, 215 East Bay Street, Jacksonville, Fla.

Idaho.—Examinations are held semi-annually in the State Capitol, Boise, Idaho, beginning at 9 A. M., the second Tuesday of March and September. Application must be received 10 days before the date of examination. Fee for residents is $10.00, for non-residents $25.00, for renewal, $2.00 annually. Application for a Certificate of Registration is made to the Department of Law Enforcement, Boise, Idaho, in writing under oath in such form and accompanied by such proof of the applicant's fitness to practice as the Department may from time to time prescribe. Must be accompanied by an unmounted photograph taken within a year.

Illinois.—Structural engineers' examinations include written and oral tests, and embrace subjects normally taught in schools of structural engineering. They occupy three days and cover theoretical and applied mechanics, definitions, general engineering knowledge, stress analysis, static and moving loads, design and construction in reinforced concrete, steel, wood, masonry and foundations. Fee for examination $10.00, for certificate of registration $5.00, for examination to determine preliminary education $5.00, for restoration of an expired certificate $5.00, for renewal of certificate $1.00 annually, for certificate to those who hold a like certificate from another State or country, $15.00. Application for certificate is made upon prescribed blanks to the Department of Registration and Education, Springfield, Ill.

Iowa.—Examinations are required as prescribed by the Board. Fee for examination $15.00, for certificate of registration $10.00 additional, for certificate

without examination to person registered in another State, $10.00. Application for examination is made to the State Board of Engineering Examiners, Box 923, Des Moines, Iowa.

Louisiana.—Examinations are required of all who are not graduates of an engineering college or school of good standing. Examination for surveying covers geometry, plane trigonometry, plane surveying and practical use of instruments; for engineering, covers in addition, physics, including practical problems in design and construction. Fee for examination $25.00, for registration by diploma $25.00, for registration of holder of license from another State $15.00, for issuing license certificate $1.00, engineering renewal license $3.00 annually, surveying renewal license $1.00 annually. Application for license or examination is made to the State Board of Engineering Examiners, Maison Blanche Building Annex, New Orleans, La.

Michigan.—Examinations are required of all who desire to begin the practice of architecture, engineering or surveying as principal or in responsible charge, except those from other States, and include English language and other appropriate subjects. Fee for examination $5.00, for certificate of registration $15.00 additional, for certificate of registration without examination $20.00, for renewal of certificate $5.00 every five years. Application for examination is made to the State Board of Examiners for the Registration of Architects, Engineers, and Surveyors, 80 Griswold St., Detroit, Mich.

New York.—Present practitioners must obtain licenses before May 14th, 1922. If evidence presented in the application does not appear to the Board to be conclusive or warranting issuance of a certificate, applicant may present further evidence, which may include the result of a required examination. Fee for certificate to practice engineering or land surveying $25.00, for certificate to practice both engineering and land surveying $35.00. Application for certificate must be made on a prescribed form to Regents of the University of the State of New York, Albany, N. Y.

Oregon.—Examinations may be either oral or partly oral and partly written. Fee for examinations $10.00, for certificate of registration $5.00 additional, for certificate of registration without examination $15.00. Application for examination is made to the Secretary, State Board of Engineering Examiners, Corbett Building, Portland, Ore.

Virginia.—Examinations are required of all applicants except those from other States, as prescribed. They are held at least once each year at Richmond, Va., and at such other places and times as the Board may designate. Fee for each examination $20.00. Application for examination is made to the State Board of Examination and Certification of Architects, Professional Engineers, and Land Surveyors, Richmond, Va. Registration is optional; present practitioners are not limited as to time within which to register.

Wyoming.—Examinations are required of all applicants except those licensed under previous Acts, and consist of a written examination and an investigation by the Board of record, training, and experience. Fee for examination $10.00, for certificate of license without examination $5.00. Application for examination is made to the State Board of Examining Engineers, Cheyenne, Wyo.

ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day; during July and August, it is closed at 6 P. M.

FUTURE MEETINGS

December 1st, 1920.—8.00 P. M.—This will be a regular business meeting of the Society. A paper by J. Albert Holmes, M. Am. Soc. C. E., entitled "Some Investigations and Studies in Hydraulic-Fill Dam Construction" will be presented for discussion.

A synopsis of this paper is printed in this number of *Proceedings*.

SECOND MEETINGS OF THE MONTH

Under authority given by the Board of Direction at its meeting of August 9th, 1920, the Acting Secretary has made an arrangement with the New York Section whereby the latter will take over the second meeting of the month, and will thus hold its own meetings on the third Wednesday of each month.

The programmes contemplated by the New York Section are similar to those heretofore offered by the Society's Committee on Second Meeting of the Month, and it is understood that all members of the Society are invited to attend the meetings regardless of whether or not they may be members of the Section. This arrangement gives each member the same privilege of attendance at meetings which he has heretofore enjoyed, and is deemed especially desirable since there has been considerable doubt as to the attendance that might develop at the several meetings if three were held in each month.

ANNUAL MEETING

The Sixty-eighth Annual Meeting will be held at the Headquarters of the Society, 33 West 39th Street, New York City, on Wednesday and Thursday, January 19th and 20th, 1921. The Business Meeting will be called to order at 10 o'clock on Wednesday morning. The Annual Reports will be presented, Officers for the ensuing year elected, members of the Nominating Committee appointed, Reports of Special Committees presented for discussion, and other business transacted.

RULES ADOPTED BY THE BOARD OF DIRECTION FOR THE USE OF THE ADDRESSOGRAPH AND MAILING LIST OF THE SOCIETY.

The following rules were adopted by the Board of Direction at its meeting of November 9th, 1920, for the use of the Addressograph and Mailing List of the Society:

1.—The Addressograph shall be used by the Secretary only in the routine of the issuance of Society matter and for the issuance of notices of joint meetings of this and other societies.

2.—The Mailing List shall be furnished by the Secretary:

(*a*) To Local Sections of the Society free of charge for legitimate use by them in relation to Society matters, and

(*b*) To individual members of the Society at cost price for their communication with the membership regarding Society affairs.

3.—Neither Mailing Lists nor the use of the Addressograph shall be furnished to any one for commercial or advertising purposes.

4.—In the difficulty of prescribing rules to cover each case that may arise in the future, the Secretary is authorized to use his discretion regarding each application as to whether it is in accordance with the spirit of the rules here outlined.

5.—These rules shall be published in the *Proceedings* of the Society so that all members may have an equal chance to avail themselves of the advantages of the use of the Mailing Lists.

SEARCHES IN THE LIBRARY

As the Library of the American Society of Civil Engineers has been merged in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service. A more comprehensive statement in regard to this matter will be found on page 21 of the Year Book for 1920.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper. Written discussion on a given paper will be closed three months after the paper has been published, so that the author's closure can be printed four months after the paper, and the discussions and closure distributed in pamphlet form.

All manuscript submitted for publication should preferably be typewritten, and always double spaced. Drawings and diagrams should be on separate sheets, drawn to a scale suitable for about one-half to one-fourth reduction.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion will be set down for presentation to a future meeting of the Society, and, on these, oral discussion, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 35 of the Year Book for 1920.

LOCAL SECTIONS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Section, Organized 1905.

M. M. O'Shaughnessy, President; Nathan A. Bowers, Secretary-Treasurer, 531 Rialto Building, San Francisco, Cal.

The San Francisco Section of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Engineers' Club, 57 Post Street, on the third Tuesday of February, April, June, August, October, and December, the last being the Annual Meeting of the Section.

Informal luncheons are held at noon, every Wednesday, at the Engineers' Club, where special tables are reserved for members and guests of the Section.

The by-laws of the Section provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Section, Organized 1908.

Oliver T. Reedy, President; John S. Means, Secretary-Treasurer, 1574 Marion Street, Denver, Colo.

The meetings of the Colorado Section of the American Society of Civil Engineers (Denver, Colo.) are held on the second Monday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesday, at 12.30 P. M., at Daniels and Fisher's.

Visiting members are urged to attend the meetings and luncheons.

Atlanta Section, Organized 1912.

V. H. Kriegshaber, President; Park A. Dallis, Secretary-Treasurer, 1024 Candler Building, Atlanta, Ga.

Informal luncheons are held for members of the Section on the last Monday of each month, at 12.30 P. M., to which visiting members of the American Society of Civil Engineers will be welcomed. The place is not fixed, but this information will be furnished on application to the Secretary.

Baltimore Section, Organized 1914.

Ezra B. Whitman, President; George S. Robertson, Secretary-Treasurer, 1628 Linden Avenue, Baltimore, Md.

Cincinnati Section, Organized 1920.

Ward Baldwin, President; Alphonse M. Westenhoff, Secretary, 1614 Westmoreland Avenue, Cincinnati, Ohio.

Cleveland Section, Organized 1914.

W. P. Brown, President; George H. Tinker, Secretary-Treasurer, 516 Columbia Building, Cleveland, Ohio.

The regular meetings of the Section are held on the second Wednesday of each month, at 12.15 P. M., in the Rooms of the Electrical League, on the Fourteenth Floor of the Statler Hotel. Luncheon is served at these meetings, and visiting members are invited to attend.

Connecticut Section, Organized 1919.

Charles Rufus Harte, President; Clarence M. Blair, Secretary-Treasurer, 785 Edgewood Avenue, New Haven, Conn.

The Annual Meeting of the Section is held in April. The Section also holds fortnightly meetings alternating between Hartford and New Haven, Conn. These meetings are informal luncheon gatherings held usually at noon on Saturday, a notice being mailed to each member calling attention to the date, time, place, and subject for discussion. Members are privileged to invite guests regardless of their affiliation as engineers. No set speeches are scheduled, but certain members are asked to be prepared to present the assigned subject and lead in a general discussion.

Detroit Section, Organized 1916.

David A. Molitor, President; Dalton R. Wells, Secretary-Treasurer, 624 McKerchey Building, Detroit, Mich.

The regular meetings of the Section are held on the second Friday of December, April, and October, the last being the Annual Meeting.

District of Columbia Section, Organized 1916.

David S. Carll, President; James H. Van Wagenen, Secretary-Treasurer, 719 Fifteenth Street, N. W., Washington, D. C.

Duluth Section, Organized 1917.

W. A. Clark, President; Walter G. Zimmermann, Secretary, Wolvin Building, Duluth, Minn.

The regular meetings of the Section are held at noon on the third Monday of each month (usually at the Kitchi Gammi Club), with luncheon, followed by a short business session and the reading of papers. Visiting members of the American Society of Civil Engineers can secure from the Secretary definite information relative to the meetings, at which they will be welcomed. The Annual Meeting is held on the third Monday in May.

Illinois Section, Organized 1916.

A. F. Reichmann, President; W. D. Gerber, Secretary-Treasurer, 913 Chamber of Commerce, Chicago, Ill.

The regular meetings of the Section are held on the second Monday of March, June, September, and December, the last being the Annual Meeting. The hour and place of meetings are not fixed, but this information will be furnished on application to the Secretary.

Iowa Section, Organized 1920.

J. E. Van Liew, President; R. W. Crum, Secretary, Iowa State College, Ames, Iowa.

Louisiana Section, Organized 1914.

A. T. Dusenbury, President; Eugene F. Deléry, Secretary, 602 Sewerage and Water Board Building, New Orleans, La.

The regular meetings of the Section are held at The Cabildo, New Orleans, La., on the first Monday of January, April, July, and October.

Nebraska Section, Organized 1917.

Clark E. Mickey, President; Homer V. Knouse, Secretary-Treasurer, 200 City Hall, Omaha, Nebr.

Regular meetings of the Section are held on the first Saturday of each month, except July and August, and at such places as may be appointed from time to time by the Executive Committee. The Annual Meeting is held in Lincoln, Nebr., on the second Friday in January.

Visiting members of the Society are especially urged to communicate with the Secretary when in the city.

New York Section, Organized 1920.

William J. Wilgus, President; W. T. Chevalier, Secretary, 17 Battery Place, New York City.

The Annual Meeting is held in May. The regular meetings of the Section are held in the Engineering Societies Building, 29 West 39th Street, New York City, on the third Wednesday of each month.

Northwestern Section, Organized 1914.

Charles L. Pillsbury, President; Paul C. Gauger, Secretary, 945 Osceola Ave., St. Paul, Minn.

The meetings of the Section are held bi-monthly, alternating between St. Paul and Minneapolis, on the third Friday of each month. Information as to the time and place of such meetings will be furnished on application to the Secretary.

Philadelphia Section, Organized 1913.

John Meigs, President; Henry T. Shelley, Secretary, 416 City Hall, Philadelphia, Pa.

The regular meetings of the Section are held at the Engineers' Club of Philadelphia, 1317 Spruce Street, on the first Monday in January, April, and October, the last being the Annual Meeting. Special meetings are also held, in order to provide an opportunity for members to take a more active part in the work of the Section.

Pittsburgh Section, Organized 1917.

Morris Knowles, President; Nathan Schein, Secretary-Treasurer, 426 City-County Building, Pittsburgh, Pa.

Portland (Ore.) Section, Organized 1913.

J. C. Stevens, President; C. P. Keyser, Secretary, 318 City Hall, Portland, Ore.

The Annual Meeting of the Section is held on the second Friday in January. Other meetings are called by the President and are usually convened on Friday evenings. The place is not fixed, but this information may be obtained on application to the Secretary. All members of the American Society of Civil Engineers are cordially invited to attend the meetings.

St. Louis Section, Organized 1888 (Constitution Approved by Board, 1914).

Edward E. Wall, President; C. W. S. Sammelman, Secretary-Treasurer, 300 City Hall, St. Louis, Mo.

The Annual Meeting of the Section for the election of officers and for the transaction of business, is held on the fourth Monday in November. Two meetings each year, for the presentation and discussion of technical papers, are held in the Auditorium of the Engineers' Club of St. Louis and are open to members of the Associated Societies. Other "get-together" meetings are held regularly for dinner or luncheon on the fourth Monday of each month except July, August, and November.

San Diego Section, Organized 1915.

George Cromwell, President; R. C. Wueste, Secretary-Treasurer, Bonita, Cal.

The San Diego Section of the American Society of Civil Engineers meets on

announcement. Pilgrimages to points of engineering interest are made at intervals throughout the year.

Seattle Section, Organized 1913.

John L. Hall, President; Bertram D. Dean, Secretary, 1711 Ravenna Boulevard, Seattle, Wash.

The regular meetings of the Section with luncheon, are held at the Engineers' Club, Arctic Building, Third Avenue and Cherry Street, at 12.15 P. M., on the last Monday of each month. Informal luncheons are also held at 12.15 P. M., every Monday at the Engineers' Club.

Special evening meetings are held from time to time for the purpose of discussing important topics, and information concerning these meetings may be had by addressing the Secretary. All members in any grade of the American Society of Civil Engineers are cordially invited to attend the meetings when in the vicinity, and, if located in this District for any length of time, their membership in the Section will be appreciated.

Southern California Section, Organized 1914.

W. K. Barnard, President; Floyd G. Dessery, Secretary, 619 Central Building, Los Angeles, Cal.

The Southern California Section of the American Society of Civil Engineers (Los Angeles, Cal.) holds regular monthly meetings on the second Wednesday of each month, the December meeting being the Annual Meeting.

Informal luncheons in connection with the Joint Technical Societies of Los Angeles are held at 12.15 P. M., every Thursday at the Broadway Department Store Café.

Spokane Section, Organized 1914.

Alfred D. Butler, President; Charles E. Davis, Secretary-Treasurer, 401 City Hall, Spokane, Wash.

The regular meetings of the Section are held on the second Friday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary.

Visiting members are invited to attend the meetings.

Texas Section, Organized 1913.

Hans Helland, President; E. N. Noyes, Secretary, Deere Building, Dallas, Tex.

Utah Section, Organized 1916.

A. B. Villadsen, President, 304 Dooly Bldg., Salt Lake City, Utah.

The Annual Meeting of the Section is held on the first Wednesday in April. The time of other meetings is not fixed, but this information will be furnished on application to the President.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcome in the Reading Rooms and at the meetings of many engineering societies in all parts of the world. A list of such societies will be found on pages 42 and 43 of the Year Book of the Society for 1920.

The Engineering Societies of Wisconsin, Madison, Wis., and Vereeniging van Waterstaatsingenieurs in Nederlansch Oost-Indie, are to be added to the above mentioned list, and members of these Societies are accorded the usual courtesies and privileges of the Headquarters of the Society.

NEW BOOKS*

(From October 1st to October 30th, 1920)

The statements made in these notices are taken from the books themselves, and this Society is not responsible for them.

DONATIONS TO ENGINEERING SOCIETIES LIBRARY

ENGINEERING ELECTRICITY.

By Ralph G. Hudson. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1920. 190 pp., illus., tab., 9 x 12 in., cloth. $2.50.

This text represents the lectures given at the Massachusetts Institute of Technology to those technical students who are not specializing in electrical engineering. The course covers the general principles of electrical engineering and magnetism most frequently applied in engineering practice.

FUNDAMENTAL PRINCIPLES OF ELECTRIC AND MAGNETIC CIRCUITS.

By Fred Alan Fish. N. Y. and Lond., McGraw-Hill Book Co., 1920. 194 pp., illus., 9 x 6 in., cloth. $2.75.

This volume is intended as an introduction to the study of electric power machinery and transmission. It discusses the principles that the author considers fundamental, is intended for undergraduate students, and, therefore, does not go deeply into the physical and mathematical theory of electricity, nor include all the possible variations in conditions which might affect the application of the principles as stated.

ELEMENTS OF ENGINEERING THERMODYNAMICS.

By James A. Moyer, James P. Calderwood, and Andrey A. Potter. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1920. 216 pp., illus., tab., folded chart, 9 x 6 in., cloth. $2.50.

This treatise is an extension of a briefer work entitled "Engineering Thermodynamics", by James A. Moyer and F. A. Calderwood. It is intended to bring out the fundamental principles of the subject, particularly for use in technical colleges where special courses on steam turbines, internal combustion engines, refrigeration, and other applications of thermodynamics can be given. Additions and changes have been made to the original material, to make the book better adapted to special requirements.

THE PRACTICE OF LUBRICATION:

An Engineering Treatise on the Origin, Nature, and Testing of Lubricants, Their Selection, Application, and Use. By T. C. Thomsen. N. Y. and Lond., McGraw-Hill Book Co., 1920. 607 pp., illus., 9 x 6 in., cloth.

After a brief, practical description of commercial oils, fats, and greases, the author describes the chemical and mechanical tests used and explains the laws of friction. Methods of lubrication are then described. The greater portion of the book is given to a discussion of the selection and use of lubricants for specific types of machinery, covering all classes of machines. Oil recovery, purification, storage, and distribution, and oils for cutting and for transformers are also discussed. The viewpoint throughout is that of the engineer rather than the chemist.

CONDENSED CATALOGUES OF MECHANICAL EQUIPMENT:

Comprising Condensed, Uniformly Presented and Illustrated Catalogue Information Covering the Products of Manufacturers of Various Classes of Mechanical Equipment, with General Classified Directory . . . and Consulting Engineers' Directory. Tenth Annual Volume, October, 1920. N. Y., American Society of Mechanical Engineers. 1004 pp., illus., 9 x 6 in., cloth. $4.00.

The tenth edition of this catalogue and directory of mechanical equipment and consulting engineers follows the established lines, although the data on A. S. M. E. standards have been omitted from this issue. Five hundred and nine firms are represented by condensed catalogues of their products, this section being eighty pages longer than in 1919. The directory of mechanical equipment, in which manufacturers are listed under products, is 10% larger, and the directory of consulting engineers covers 60% more pages than before. Various improvements have also been made to facilitate convenient reference.

* Unless otherwise specified, books in this list have been donated by the publishers.

TIN, SHEET-IRON, AND COPPER-PLATE WORKER.

By Leroy J. Blinn. New Enlarged Edition. N. Y., Henry Carey Baird & Co., Inc., 1920. 334 pp., illus., tab., 8 x 5 in., cloth. $3.00.

A revised edition of a well-known work on the working of sheet-metal, containing rules for laying out work, recipes for solders, cements, and lacquers, as well as the tables and other data used by the mechanic.

THE CHEMICAL ANALYSIS OF STEEL-WORKS' MATERIALS.

By Fred Ibbotson. Lond. and N. Y., Longmans, Green & Co., 1920. 296 pp., tab., 9 x 6 in., cloth. $7.50.

This work is a revised edition of those portions of "The Analysis of Steel-Works' Materials", published in 1902, which treated of the analytical chemistry of the raw materials and finished products of ferrous metallurgy. The material on pyrometry and microscopy is omitted from the revised book.

THE IRON ORES OF LAKE SUPERIOR:

Containing Some Facts of Interest Relating to Mining and Shipping of the Ore and Location of Principal Mines. Fourth Edition, with Original Maps of the Ranges. By Crowell and Murray. Cleveland, The Penton Press, 1920. 301 pp., illus., maps, tab., 9 x 6 in., cloth. $5.00.

This is a concise account of the development and present status of the mining properties of the Lake Superior region and of the iron mining industry in general. The introductory chapters treat of the early history of the region, its geology and mineralogy, and the methods of drilling, exploring, mining, and analyzing the ores, accompanied by extensive records of the average analysis of the various ores and a chapter on their valuation. The remaining and larger portion of the book is given to brief descriptions of the individual mines, accompanied by sketch maps of each range.

MINE GASES AND VENTILATION:

Textbook for Students of Mining, Mining Engineers, and Candidates Preparing for Mining Examinations; Designed for Working Out the Various Problems That Arise in the Practice of Coal Mining, as They Relate to the Safe and Efficient Operation of Mines. By James T. Beard. Second Edition, Revised and Enlarged. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1920. 433 pp., illus., pl., tab., 8 x 6 in., flexible cloth. $4.00.

The present edition of this treatise on mine ventilation has been much enlarged. New sections on Safety Lamps, Oils, Breathing Apparatus, and Rescue Work have been added, together with numerous tables. The endeavor has been to make the book a standard work on the subject.

MINERALOGY:

An Introduction to the Study of Minerals and Crystals. By Edward Henry Kraus and Walter Fred Hunt. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1920. 561 pp., illus., 9 x 6 in., cloth. $4.50.

The aim of the authors of this work has been to present, in a direct, simple manner, and within a single volume, the essentials of the various phases of the science. The conventional line drawings of crystals have been largely replaced by photographs of models, natural crystals, and minerals, such as are actually handled in the laboratory. An attempt has also been made to vitalize the subject by including chapters on the importance of mineralogy, on gems and precious stones, and on the production and uses of the important economic minerals. Numerous photographs and short sketches of noted mineralogists have been added. The book treats of crystallography, blowpipe analysis and descriptive mineralogy, and has determinative tables.

GEOLOGY OF THE NON-METALLIC MINERAL DEPOSITS

Other Than Silicates; Vol. I, Principles of Salt Deposition. By Amadeus W. Grabau. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1920. 435 pp., illus., maps, tab., 9 x 6 in., cloth. $5.00.

This book, the author states, is essentially a treatise on applied stratigraphy. It deals with non-metallic mineral deposits exclusive of silicates, but with merely incidental consideration of hydro-carbons and some native elements, which will be treated more fully later. It may be called a handbook of salt geology, if this name is understood to include nitrates, borates, phosphates, and similar deposits. Emphasis is laid on the geological relationships of these deposits and the conditions under which such deposits form are studied.

THE COAL TRADE:

The Year Book of the Coal and Coke Industry. By Sydney A. Hale. 47th Annual Edition, 1920. N. Y., The Estate of F. E. Saward. 352 pp., tab., 8 x 6 in., cloth. $4.00.

The present volume is, the compiler states, the largest in size and the widest in scope yet issued. It includes a variety of statistical tables of interest to those in the coal industry, brought to the latest possible dates, and information showing the development of the industry during the past year. The book contains statistics of production, exports, imports, costs, prices, ocean rates, wages, and similar matter, as well as reviews of important occurrences.

MODERN PULP AND PAPER MAKING:

A Practical Treatise. By G. S. Witham, Sr. N. Y., Book Dept., The Chemical Catalog Co., Inc., 1920. 599 pp., illus., tab., 9 x 6 in., cloth. $6.00.

This treatise is the work of a writer with long practical experience in the industry, and is intended to fill the need for a practical work on paper manufacture as carried on in America, that is not too abstruse and technical for the average papermaker, but which is thorough enough to be of real value. The book describes the equipment and processes in actual use, and also treats of plant design and personnel.

FINANCIAL ENGINEERING:

A Text for Consulting, Managing, and Designing Engineers and for Students. By O. B. Goldman. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1920. 271 pp., illus., tab., 9 x 6 in., cloth. $3.50.

The author of this treatise has in mind the practicing engineer, interested in installing plants that will have the highest financial efficiency, although not necessarily the highest mechanical efficiency. The book is therefore an exposition of methods for determining the comparative value of the things which the engineer must use, and the financial efficiency of undertakings. Contents: Cost Segregation; Fundamental Financial Calculations; Basic Costs; Vestances; Unit Cost Determination; Determination of Size of System for Best Financial Efficiency; Determination of Type and Size of Units.

COMMON SENSE AND LABOUR.

By Samuel Crowther. Garden City, N. Y., Doubleday, Page & Co., 1920. 284 pp., 8 x 5 in., cloth. $2.00.

The author discusses the causes of present-day dissatisfaction between workmen and employers, the various remedies that have been suggested, and the results obtained in actual cases. The text is written in readable style and is of interest to employers.

INDUSTRIAL HOUSING:

With Discussion of Accompanying Activities, Such as Town Planning, Street Systems, Development of Utility Services, and Related Engineering and Construction Features. By Morris Knowles. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1920. 408 pp., illus., tab., 9 x 6 in., cloth. $5.00.

The author endeavors to develop the things which must be considered in order to provide not merely houses but homes, with all the attendant attributes of a living and livable town. His book is the result of a realization that the preparation of a successful town plan and the development of a contented industrial community are dependent on the action of many agencies and require the co-ordination of men of many professions. Although the work of an engineer, the book is not a treatise on technical practice, but is intended to represent the views of experts in architecture, town planning, landscape gardening, engineering, sanitation, public utilities, building, real estate, civics, and business, for whom, together with city officials, the book is intended.

THE LOCOMOTIVE UP TO DATE.

By Chas. McShane. Revised by Author. Chic., Griffin & Winters, 1920. 893 pp., illus., pl., 9 x 6 in., cloth. $5.00.

The first edition of this book appeared more than twenty years ago, and found popularity as a clear explanation of the construction, operation, and repair of the locomotive, suited to the needs of railway men without special engineering knowledge. The present edition has been revised, enlarged, and partly rewritten, to meet modern conditions.

DONATIONS TO THE READING ROOM

THE AMERICAN ENGINEERS IN FRANCE.

By William Barclay Parsons, M. Am. Soc. C. E. New York and London, D. Appleton and Company, 1920. 17 + 429 pp., illus., tab., map, 9 x 6 in., cloth. (Presented by the Author.)

The author states that this book is not intended to be a history or detailed account of the work of the American engineers in France, but is a review of the work done in all fields

of engineering activities, in all parts of France, by the nine regiments of engineers raised as the first contribution from America to the Allied cause, with which the author and many other members of the Society served. To this brief outline is added personal experiences of the author and others associated with these regiments and some suggestions of what entered into the daily lives of the men and their relations with the engineers of the Allied Armies.

ELEMENTS OF PLANE TRIGONOMETRY.

By Richard J. McCarty, M. Am. Soc. C. E. Chic., American Technical Society, 1920. 89 pp., illus., tab., 8½ x 5½ in., cloth. (Presented by the Author.)

The purpose of this book, as stated in the Preface, is to develop the principles of Plane Trigonometry in the simplest and most natural manner. The geometrical principles on which the subject is based are clearly presented, it is said, ratios of angular measure are treated as abstract numbers, and conventions of algebraic signs are given so as to show that their purpose is to make generally true formulas. The principles have been developed in ascending order with special reference to immediate application. For this reason logarithms have been omitted and round numbers used. The data and the arithmetical work have been simplified and illustrative examples taken from practice included. In the final chapters the treatise is extended, it is stated, to prepare the way for the study of Spherical Trigonometry and higher mathematics.

EXPORT REGISTER OF THE FEDERATION OF BRITISH INDUSTRIES.

Lond., The Federation of British Industries, 1920. 328 + 312 pp., 9¾ x 7¼ in., illus., cloth.

The Introduction states that this book, embracing as it does every important manufacture in Great Britain, gives a comprehensive survey of the field of British industry and is designed for use by all who buy British goods throughout the world. It contains a description of the organization and aims of the Federation, its officers, etc., together with information relative to its Industrial Grouping System; a list of the trade organizations which comprise its membership, arranged alphabetically under the Group System, with the names and addresses of their exporting members; a list of the companies and firms that are members of the Federation, their addresses, cables, codes, and names of their Overseas Agents; an alphabetical list of manufactured articles, with names of firms manufacturing them; and a section devoted to advertising for the members of the Federation.

HIGHWAYS GREEN BOOK, 1920.

First Annual Edition. Washington, D. C., American Automobile Association, 1920. 6 + 525 pp., tab., 9¼ x 6¼ in., cloth. $3.00.

This work, it is stated, is an encyclopedia of information on National, State, and local highways legislation, development, construction, and maintenance. Much of the subject-matter has been prepared, it is said, by leading highway authorities in the United States and Canada, and should prove to be useful to legislators interested in questions relating to road laws, motor-vehicle taxation, registration, regulation, etc. It is also intended for use by manufacturers of road materials, machinery, and equipment, as well as by highway officials, engineers, and contractors. The Contents are: Part I, Information Relating to Road Improvements Under Federal, State, and Local Control; Part II, Highway Construction and Maintenance; Part III, Miscellaneous Information and Data.

A PRACTICAL TREATISE ON ENGINEERING AND BUILDING FOUNDATIONS,

Including Sub-Aqueous Foundations; Vol. I, Ordinary Foundations. By Charles Evan Fowler, M. Am. Soc. C. E. Fourth Edition, Revised and Enlarged. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Limited, 1920. 31 + 531 pp., illus., pl., tab., 9¼ x 6¼ in., cloth. $5.00. (Presented by the Author.)

This book is the first of three volumes into which the new edition of the author's "Treatise on Sub-Aqueous Foundations" has been expanded. The second and third volumes are devoted to Deep Foundations and Dredges and Dredging, respectively. This first volume includes, it is stated, all the original matter on piles, pile-driving, and ordinary foundations, together with much additional information on the masonry of retaining walls, bridge abutments, and bridge piers, including calculations and designs, all of which makes it a comprehensive up-to-date treatise on Ordinary Foundations. In addition, Appendices I to XI, inclusive, contain specifications for dams, bridges, masonry, cement, creosoted timber, and floating pile-drivers, as well as a description of metal sheet piling and pile-driving data.

THE DANUBE-AEGEAN WATERWAY.

By Prince Lazarovich-Hrebellianovich. N. Y., Typewritten Manuscript, 1920. 80 pp., maps, illus., tab., 12 x 9 in., paper. (Presented by the Author.)

The plan for constructing the proposed Danube-Aegean Waterway, from the Danube in Serbia, using the Morava and Vordar Rivers, to Salonika on the Aegean Sea, was initiated by the author and presented by him to the Serbian and Turkish Governments in 1909. In this book, the author has presented the history of the project, together with its political, economic, financial, and engineering aspects.

MEMBERSHIP

(From October 8th to November 4th, 1920)

ADDITIONS

MEMBERS

		Date of Membership.
ADAMS, ELMER ELLSWORTH. Asst. Engr., M. of W., G. N. Ry., 212 Thirty-fifth Ave., North, Seattle, Wash.	Assoc. M. M.	April 7, 1915 Oct. 11, 1920
BATON, GEORGE SCOTT. Cons. Engr., 2412 First National Bank Bldg., Pittsburgh, Pa.		Oct. 11, 1920
CASE, ALBERT DEERING. Office Engr., New York Shipbuilding Corporation, 123 North Warner St., Woodbury, N. J.		Oct. 11, 1920
CASSIDY, JAMES EDWARD. Lt.-Col., Engrs., U. S. A., Office, Chf. of Engrs., Washington, D. C.		Oct. 11, 1920
COLBERT, LEO OTIS. Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Washington, D. C.		Oct. 11, 1920
COMLY, JAMES RETZER. Asst. Engr., San Diego & Ariz. Ry., 4105 Falcon St., San Diego, Cal.	Assoc. M. M.	April 2, 1913 Oct. 11, 1920
CRAWFORD, CHARLES JOHN. Apartado 161, Tampico, Tamps., Mexico	Assoc. M. M.	Jan. 31, 1911 Oct. 11, 1920
DAVIS, CHARLES ELDRIDGE. Prin. Asst. City Engr., 401 City Hall, Spokane, Wash.	Assoc. M. M.	April 16, 1918 Oct. 11, 1920
DEAN, WILLIS JOHNSON. Asst. Mgr. and Structural Designing Engr., Condron Co., 707 Brompton Ave., Chicago, Ill.	Assoc. M. M.	April 1, 1914 Oct. 11, 1920
EIFFERT, CURT HENRY. Div. Engr., Miami Conservancy Dist., 11 South Monument Ave., Hamilton, Ohio.	Assoc. M. M.	April 16, 1918 Oct. 11, 1920
ENSEY, RICHARD FAHNESTOCK. Asst. Engr., Isham Randolph & Co., Box 1145, Jacksonville, Fla.	Assoc. M. M.	April 5, 1910 Oct. 11, 1920
FISHER, FREDERICK WILLIAM. Adjuster, Employment and Safety Mgr., Rochester Gas & Elec. Corporation, 34 Clinton Ave., N., Rochester, N. Y.	Assoc. M. M.	July 9, 1912 Oct. 11, 1920
GARNETT, BENJAMIN JAY. Bridge Engr., City Engr.'s Office (Res., 3327 Tekoa St.), Spokane, Wash.	Jun. Assoc. M. M.	Nov. 1, 1910 Jan. 15, 1917 Oct. 11, 1920
HADLEY, EVERETT ADDISON. Chf. Engr., Mo. Pac. R. R., 1055 Ry. Exchange, St. Louis, Mo.		Oct. 11, 1920
HOWARD, CLEMENT JOHN. City Engr., Corpus Christi, Tex.	Jun. Assoc. M. M.	Sept. 6, 1904 Sept. 3, 1912 Oct. 11, 1920
HOWLAND, WILLIAM JETHRO. 15 Chestnut St., Melrose, Mass.		Oct. 11, 1920
HUGHES, GEORGE ALFRED. Civ. Engr., Thomas E. Murray, Inc., 1259-A, Bergen St., Brooklyn, N. Y.	Assoc. M. M.	May 13, 1918 Oct. 11, 1920
HUSSELMAN, ROY. Cons. Engr., 606 Cuyahoga Bldg., Cleveland, Ohio	Assoc. M. M.	June 18, 1918 Oct. 11, 1920
JACKSON, JESSE AARON. Chf. Computer, Office, City Engr., Seattle, Wash.	Assoc. M. M.	Feb. 28, 1911 Oct. 11, 1920
KAPPEYNE, JACOBUS. Care, Ford, Bacon & Davis, 501 Chamber of Commerce Bldg., Pittsburgh, Pa.		Oct. 11, 1920
KELSEY, LOUIS DE COU. City Engr., Raymond, Wash.	Assoc. M. M.	Nov. 12, 1913 Oct. 11, 1920

MEMBERS (*Continued*)

		Date of Membership.
KIPP, BURDETT. Res. Engr., Degnon Contr. Co., 423 West 120th St., New York City		Aug. 9, 1920
KRAUSE, MARK CHAMPION. Cons. Engr., Susquehanna Trust Bldg., Williamsport, Pa	Assoc. M.	May 31, 1916
	M.	Oct. 11, 1920
LEE, ENGBERT A. Chf. Engr., Colorado Dept., Am. Smelting & Refining Co., 517 Broadway, Pueblo, Colo	Assoc. M.	Oct. 7, 1903
	M.	Oct. 11, 1920
LOTT, HARRY CHICKALL. Lt.-Col., R. E.; Asst. Director of Works (E. and M. Section), Baghdad, Mesopotamia		April 19, 1920
MARSTEN, OLE JACOB. 1956 Bellevue Rd., Harrisburg, Pa		Oct. 11, 1920
MILLER, ELMER KAUFMAN. Structural Estimator and Designer, The Brown Hoisting Machinery Co., 11802 Castlewood Ave., N. E., Cleveland, Ohio		Oct. 11, 1920
MUMM, HANS, JR. Dist. Engr., Portland Cement Assoc., 1010 Gasco Bldg., Portland, Ore	Assoc. M.	July 9, 1912
	M.	Oct. 11, 1920
MURRAY, ROBERT HEFFRON. Plant Mgr., Tubize Artificial Silk Co. of America, City Point, Va		Oct. 11, 1920
OSBORN, KENNETH HOWARD. Structural Engr., Osborn Eng. Co., 2848 Prospect Ave., S. E., Cleveland, Ohio	Jun.	Oct. 5, 1909
	Assoc. M.	Mar. 4, 1914
	M.	Oct. 11, 1920
PETERS, ALBERT AYER. Cons. Engr. (Howe & Peters), 24 California St., San Francisco, Cal	Assoc. M.	Jan. 15, 1917
	M.	Oct. 11, 1920
RANKIN, CARL ROY. Constr. Engr., Hetch Hetchy Water Supply, Room 375, City Hall, San Francisco, Cal	Assoc. M.	June 23, 1916
	M.	Oct. 11, 1920
ROUTH, JAMES WYNBOURNE. Director and Chf. Engr., Bureau of Municipal Research, Inc., 25 Main St., East, Rochester, N. Y	Assoc. M.	Aug. 31, 1915
	M.	Oct. 11, 1920
RUDE, GILBERT THOMAS. Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Washington, D. C		Oct. 11, 1920
SCHULTZ, CHARLES. City Engr. and Water-Works Supt., 308 West Virginia St., McKinney, Tex	Jun.	Nov. 1, 1904
	Assoc. M.	Sept. 5, 1911
	M.	Oct. 11, 1920
SHEPARD, GEORGE MILSON. Cons. Engr., Associate with L. P. Wolff, 1000 Guardian Life Bldg., St. Paul, Minn.	Assoc. M.	June 11, 1917
	M.	Oct. 11, 1920
SLATTERY, JOHN RODOLPH. Fort Leavenworth, Kans		Oct. 11, 1920
SMITH, CHESTER KITCH. Field Engr., Pacific Region, U. S. Railroad Administration, 65 Market St., San Francisco, Cal	Assoc. M.	Dec. 3, 1913
	M.	Oct. 11, 1920
WALLING, VICTOR ROY. Prin. Asst. Engr., Chi. & W. Ind. R. R., Room 315, Dearborn Station, Chicago, Ill	Assoc. M.	June 6, 1906
	M.	Oct. 11, 1920
WELLER, WILLIAM EARL. City Engr., City Engr.'s Office, Binghamton, N. Y	Jun.	Jan. 7, 1908
	Assoc. M.	Oct. 3, 1911
	M.	Oct. 11, 1920
WHEELER, WALTER HALL. Cons. Engr. and Steel Contr., 1110 Metropolitan Life Bldg., Minneapolis, Minn	Assoc. M.	June 18, 1918
	M.	Oct. 11, 1920
WIGLEY, CHESTER GREENHALGH. Cons. Engr., Associated with Clyde Potts, 30 Church St., New York City	Assoc. M.	Oct. 1, 1913
	M.	Oct. 11, 1920
WONSON, SAMUEL LAMSON. Bridge Engr., Mo. Pac. R. R., 1055 Railway Exchange Bldg., St. Louis, Mo	Assoc. M.	Oct. 5, 1909
	M.	Oct. 11, 1920

ASSOCIATE MEMBERS

	Date of Membership.
ALLEN, HUGH SIDNEY. Asst. Engr., Kern County Land Co., 2421 Sunset Ave., Bakersfield, Cal	Oct. 11, 1920
ARNOLD, WESLEY MAX. Contr. Engr., Turner Constr. Co., Wade Bldg., Cleveland, Ohio	Oct. 11, 1920
BARBOUR, LEROY WRIGHT. Res. Engr., Cushing Oklahoma Refinery, 415 South 5th St., Ponca City, Okla	April 19, 1920
BATHURST, JOHN FRANCIS. (Grahn Constr. Co.), 638 Plymouth Bldg., Minneapolis, Minn	Oct. 11, 1920
BEAUMONT, HARRY MAHLON. 485 Ripka St., Roxborough, Philadelphia, Pa.	Oct. 11, 1920
BENNETT, BOYD ANDERSON. Engr., City of Lynchburg, Box 51, Lynchburg, Va	Oct. 11, 1920
BOOKER, WARREN H. Highway Engr., Mees & Mees, 310 Trust Bldg., Charlotte, N. C	Oct. 11, 1920
BOUVÉ, WALTER ALEXANDER. Constr. Engr., Gen. Chemical Co., Bay Point, Cal	Oct. 11, 1920
BREWSTER, CHARLES VALENTINE. Asst. Res. Engr., N. Y. C. R. R., 300 West Onondaga St., Syracuse, N. Y	Oct. 11, 1920
BROWN, AMBROSE BEAUCHAMP. Highway Engr., Bureau of Public Roads, 403 Col. Hudson Bldg., Ogden, Utah	Oct. 11, 1920
BROWN, CLARENCE COWGILL. 6041 McPherson Ave., St. Louis, Mo	Jun. Feb. 28, 1911 Assoc. M. Oct. 11, 1920
BYRNES, HARRY CADY. Field Engr., State Highway Comm., First National Bank Bldg., Lamar, Colo	Oct. 11, 1920
CAMPBELL, EUGENE OLYN. Structural Engr. and Designer, Selden-Breck Constr. Co. (Res., 4151 West Florissant Ave.), St. Louis, Mo	Oct. 11, 1920
CARROTHERS, HENRY HARRISON. 3222 Cleveland Ave., Kansas City, Mo	June 1, 1920
CARUTHERS, WILLIAM HAMPDEN. Mgr., Paving Dept., The Barrett Co., 705 Laclede Gas Bldg., St. Louis, Mo	Oct. 11, 1920
CRESSWELL, THOMAS TALLEYRAND. Care, Aluminum Ore Co., East St. Louis, Ill	Oct. 11, 1920
CROPPER, ROY WARRINGTON. Asst. Chf. Engr., Jacoby Eng. Co., 528 Shukert Bldg., Kansas City, Mo	Oct. 11, 1920
DEVENDORF, EARL. Asst. San. Engr., New York State Dept. of Health, 1239 Albany St., Schenectady, N. Y	Oct. 11, 1920
DITTMAN, WILLIS ARTHUR. 118 Lee Ave., Yonkers, N. Y	Oct. 11, 1920
ECKEL, CLARENCE LOUIS. Asst. Prof., Civ. Eng., Univ. of Pennsylvania, Philadelphia, Pa	Oct. 11, 1920
ECKHARD, GEORGE FREDERICK. Prof., Structural Eng., Univ. of Vermont, 433 Main St., Burlington, Vt	Oct. 11, 1920
EVELETH, BARTON HARVEY. Care, Sperry Flour Co., Ogden, Utah	Oct. 11, 1920
FARLOW, GEORGE BASTIAN. Asst. Engr., M. of W., Western Lines, B. & O. R. R., Room 400, Central Union Depot, Cincinnati, Ohio	Oct. 11, 1920
FIELDS, ARTHUR DANIEL. Structural Engr., Walter Kidde & Co. (Res., 300 East 207th St.), New York City	Oct. 11, 1920
FITZGERALD, GEORGE GERALD. Box 19, Camarillo, Cal	Oct. 11, 1920
FRY, GEORGE WASHINGTON. Care, Am. Public Service Co., Box 127, Abilene, Tex	Oct. 11, 1920

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
GARLINGHOUSE, ALBERT FREDRICK. Sales Engr., Beckwith Machinery Co., Arch and Park-Way, Pittsburgh (Res., 108 Center Ave., Aspinwall), Pa	Oct. 11, 1920
GARLINGHOUSE, LESLIE HOLMES. Asst. Chf. Engr., Bldg. Form Dept., Blaw-Knox Co., Pittsburgh (Res., 108 Center Ave., Aspinwall), Pa.	Aug. 9, 1920
GASKINS, WALTER WESLEY. Box 825, Marysville, Mich	Oct. 11, 1920
GOODWIN, ARTHUR BATES. 807 Ashbury St., San Francisco, Cal	July 6, 1920
GRAHAM, FRANK PALMER. Grove City, Pa	Oct. 11, 1920
GRASETT, COLIN SUTHERLAND. Asst. Engr., Hydro-Elec. Power Comm. of Ontario, 190 University Ave., Toronto, Ont., Canada	Oct. 11, 1920
GREEN, RICHARD OSCAR. Div. Engr., Div. No. 3, Nebraska Dept. of Public Works, 1612 West 6th St., Hastings, Nebr	Oct. 11, 1920
GRIMES, JOHN FRANK. Asst. Road Engr., Dept. of Public Roads of Kentucky, Versailles, Ky	Oct. 11, 1920
GRIMSLEY, EVELYN LLEWELLYN REEVES. 92 Beech Hall Rd., Highams Park, London, E. 4, England	July 6, 1920
GRISWOLD, HECTOR CLINTON. Lieut. (Junior Grade), C. E. C., U. S. N., Care, Col. Allan B. Wallace, 100 Woodland Ave., Summit, N. J.	Jun. Mar. 13, 1917 Assoc. M. Oct. 11, 1920
HARBERT, JOHN MURDOCH. (John M. Harbert Eng. Co.), Box 243, Indianola, Miss	Oct. 11, 1920
HARPER, HENRY GARNER. Acting Dist. Engr., State Highway Dept., Dist. No. 3, Sunbury, Pa	Oct. 11, 1920
HATHAWAY, ARTHUR STAFFORD. Asst. Prof. of Civ. Eng., Univ. of Cincinnati, 572 Terrace Ave., Clifton, Cincinnati, Ohio	Oct. 11, 1920
HAZLEHURST, JOHN GRIFFISS. Capt., Q. M. C., Constr. Div., U. S. A., Care, John C. Griffiss, 704 Georgia Ave., Chattanooga, Tenn	Oct. 11, 1920
HJUL, JAMES HANSEN. 850 Monadnock Bldg., San Francisco, Cal	Oct. 11, 1920
HOOD, BENJAMIN OLIVER. Designer and Estimator, Submarine Boat Corporation, 216 Belleville Ave., Newark, N. J	April 19, 1920
HYATT, EDWARD, JR. Office Engr., State Water Comm. of California, 632 Call Bldg., San Francisco, Cal	Oct. 11, 1920
INCH, PHILIP LOUIS. U. S. Surv., Gen. Land Office, Federal Bldg., Helena, Mont.	Oct. 11, 1920
JONES, JACOB OSCAR. Asst. Prof. of Hydraulics, Univ. of Kansas, 1714 Indiana St., Lawrence, Kans	Oct. 11, 1920
LEE, FRANCIS WALLACE. Asst. City Engr., 1724 Senate St., Columbia, S. C	Oct. 11, 1920
LEISER, FERDINAND. Res. Engr., Tidal Eng. Corporation, 522 Fifth Ave., New York City (Res., 8783 One Hundred and Twelfth St., Richmond Hill, N. Y.)	Jun. June 24, 1914 Assoc. M. Oct. 11, 1920
MCCLENDON, WILLIAM WHITAKER. (McClendon & Purnell); City Engr., Box 6, Mineral Wells, Tex	Oct. 11, 1920
MCMENIMEN, ROBERT ALOYSIOUS. Gen. Supt., Raymond Concrete Pile Co., Water-Works Park, Detroit, Mich	Oct. 11, 1920
MARS, LEWIS DONALD. Care, State Board of Health, Portland, Ore	June 1, 1920
MERRICK, THOMAS BELSHAM. Res. Engr., Du Pont Co., 5219 Wayne Ave., Philadelphia, Pa	Oct. 11, 1920
MORRISON, ROBERT LEE. Secy. and Treas., Gladding, Morrison & Ott, Box 284, Bristol, Va	Oct. 11, 1920

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
MURDOCK, ROBERT BRUCE. Engr., The Asphalt Assoc., 25 West 43d St., New York City	Jun.	Jan. 6, 1915
	Assoc. M.	Oct. 11, 1920
OWEN, BARTRAM ASHMEAD. Instr., Civ. Eng. Dept., Univ. of Pennsylvania, 411 Pine St., Philadelphia, Pa	Jun.	Mar. 14, 1916
	Assoc. M.	Oct. 11, 1920
PARKER, THEODORE BISSELL. Asst. Hydr. Engr., Elec. Bond & Share Co., 6 Locust St., Flushing, N. Y.		Aug. 9, 1920
PENNARTZ, RICHARD HUBERT. Res. Engr., Federal Aid Roads, Shawnee County, 110 West 6th St., Topeka, Kans.		Oct. 11, 1920
PIERCE, CHARLES WILLIAM. Warren, Idaho	Jun.	April 17, 1917
	Assoc. M.	Oct. 11, 1920
POCKELS, WILLIAM HENRI AUGUST FRANCIS. Res. Engr., Scott & Hume, Swift de la Plata, Puerto la Plata, Argentine Republic	Jun.	May 15, 1917
	Assoc. M.	April 19, 1920
ROSECRANS, MERLE WILLIAM. Asst. Bridge Engr., Oregon State Highway Dept., 405 North Liberty St., Salem, Ore.		Oct. 11, 1920
ROUSE, CARL EVERETT. Field Engr., Hunt Eng. Co., 3922 Locust St., Kansas City, Mo.		April 19, 1920
SAULT, LEON HERBERT. Estimator and Gen. Supervisor for H. C. Struchen, 404 Dakota Bldg., St. Paul, Minn.		Oct. 11, 1920
SCOTT, REGINALD CROWLEY. Prin. Asst. to Res. Engr., Dept., of City Transit, 3706 Stanton St., Philadelphia, Pa.		Oct. 11, 1920
SEIFRIED, JOHN FRANCIS. Senior Structural Engr., Interstate Commerce Comm., 719 North 4th St., Maywood, Ill.		July 6, 1920
SEYMOUR, EDWIN NEWBURGER. (Southern Eng. Co.), Box 567, Clarksdale, Miss.	Jun.	June 16, 1919
	Assoc. M.	Oct. 11, 1920
SHAW, BENJAMIN BRUCE. Div. Engr., M. of W., C., R. I. & P. R. R., Little Rock, Ark.		Aug. 9, 1920
SHEBLE, ERNEST KEVEN. Capt., Q. M. C., U. S. A., 336 Spreckels Bldg., San Diego, Cal.		Oct. 11, 1920
SMITH, HENRY GRADY. Div. Engr., State Highway Dept. of Georgia, Box 112, Lagrange, Ga.		Oct. 11, 1920
SOPHIAN, JOHN CHARLES. Designing Engr., Truscon Steel Co., 222 Markland Ave., Syracuse, N. Y.		Oct. 11, 1920
STEEL, JOHN ALBERT. (Wallace & Steel), Empire Bldg., Knoxville, Tenn.		Oct. 11, 1920
STEM, CLIFFORD HOEY. With Hudson Motor Car Co., 684 Jefferson Ave., East, Detroit, Mich.	Jun.	April 17, 1917
	Assoc. M.	Oct. 11, 1920
STRANDBERG, GEORGE ROBERT. Steel Squad Chf. and Asst. Engr., Stone & Webster, 147 Milk St., Boston, Mass.	Jun.	Dec. 5, 1911
	Assoc. M.	Oct. 11, 1920
SWITZER, FREDERICK GEORGE. Cons. Engr., 202 Linden Ave., Ithaca, N. Y.		Oct. 11, 1920
TAYLOR, MELBOURNE STANTON. Care, du Pont Eng. Co., Wilmington, Del.		Oct. 11, 1920
THOMPSON, ELMER ELLSWORTH, JR. 609½ West Gray St., Elmira, N. Y.		July 6, 1920
THORPE, FRANK CESSFORD. 241 Railway Exchange Bldg., Kansas City, Mo.		Oct. 11, 1920
UNDERWOOD, HARRISON AUBREY. Care, State Bldg. Comm., 709 Commercial Bank Bldg., Raleigh, N. C.	Jun.	Jan. 17, 1916
	Assoc. M.	Oct. 11, 1920

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
VANDERBROOK, RAPHAEL HENRY. Designer, Mexican Petroleum Corporation, 120 Broadway, New York City (Res., 1079 Hancock St., Brooklyn, N. Y.)	Aug. 9, 1920
WAGNER, ELMER CHESTER LOUIS. Cons. Engr., 603 Kemper Bldg., Kansas City, Mo	Oct. 11, 1920
WARDEN, ROY ELISHA. Asst. Engr., Mo. Pac. R. R., Union Station, Little Rock, Ark	Oct. 11, 1920
WEYMOUTH, CLAUDE RAYMOND. Div. Engr., Wisconsin Highway Comm., 952 Oakland Ave., Milwaukee, Wis	July 6, 1920
WILLCOX, HENRY. Constr. Engr., Kalmus, Comstock & Wescott, Inc., 412 West 20th St., New York City..	Jun. Mar. 2, 1915 Assoc. M. Oct. 11, 1920
WILSON, THOMAS RANDALL CARSON. Engr., Forest Products Laboratory, Madison, Wis	Oct. 11, 1920
WILSON, WENDELL JOHN. Field Engr., Port of Seattle, Seattle, Wash..	June 1, 1920
WINTERS, WINSTON LEE. Civ. and Hydr. Engr., 311 Merchants National Bank Bldg., Fort Smith, Ark	June 1, 1920
WOOD, CLYDE MATHESON. Contr. Engr., Automatic Sprinkler Co. of America, 433 Candler Bldg., Atlanta, Ga	Oct. 11, 1920

ASSOCIATES

MATHESON, CHARLES PEASE. Works Mgr., Tyler Tube & Pipe Co., Washington, Pa	Oct. 11, 1920

JUNIORS

COLE, ALFRED DE BOIS. Asst. Engr., Am. Agricultural Chemical Co., 286 North Broad St., Elizabeth, N. J	April 19, 1920
DOOLAN, JEROME KASEBERG. 2170 Hayes St., San Francisco, Cal	Oct. 11, 1920
FORBES, THOMAS AUSTIN. Care, Pennsylvania State Highway Dept., Saltsburg, Pa	Oct. 11, 1920
FOSTER, HOWARD LESLIE. Structural Engr., Smith, Hinchman & Grylls, 1187 Pingree Ave., Detroit, Mich	April 19, 1920
HATCH, ELLIS JOHNSON. Cost Clerk and Estimator, The Stanley Works, 53 Forest St., New Britain, Conn	April 19, 1920
JOHNSON, ROGERS BRUCE. Asst. in Civ. Eng., The Harvard Eng. School, Pierce Hall, Cambridge 38, Mass	Oct. 11, 1920
SIELKE, ALBERT VICTOR. Chf. Engr. (Sielke Eng. Co., Inc.), (Res., 857 Crotona Park, North), New York City	Oct. 11, 1920
TOBAL, JUAN CARLOS. Engr. and Archt. (Tobal, Squirru & Cia.), Sarmiento 643, Buenos Aires, Argentine Republic	Aug. 9, 1920
WILLCOX, HAROLD CASE. Engr., Carib Syndicate, Ltd., Apartado No. 90, Cartegena, Colombia	July 6, 1920

DEATHS

BONZANO, MAXIMILIAN FERDINAND. Elected Member, January 6th, 1886; died October 30th, 1920.

CATTELL, WILLIAM ASHBURNER. Elected Associate Member, May 6th, 1891; Member, October 7th, 1896; died October 17th, 1920.

DATESMAN, GEORGE ELVIN. Elected Member, February 4th, 1903; died October 18th, 1920.

ELLIS, THOMAS PENGELLY. Elected Associate Member, May 13th, 1918; died September 27th, 1920.

HICKOK, HENRY ADDISON. Elected Member, October 7th, 1896; died July, 1920.

HOWELL, ROBERTS PARSONS. Elected Associate Member, October 4th, 1905; Member, March 4th, 1913; died September 29th, 1920.

LAMB, RICHARD. Elected Associate Member, May 6th, 1891; Member, June 6th, 1900; died October 18th, 1920.

SHERMAN, JAMES HILTON. Elected Associate Member, May 15th, 1917; died October 2d, 1920.

WENTWORTH, CHARLES AUSTIN. Elected Associate Member, October 7th, 1903; Member, January 2d, 1912; died February 21st, 1920.

Total Membership of the Society, November 4th, 1920, 9 775.